COAL AGE

Vol. 9 NEW YORK, JUNE 17, 1916 No. 25

Why Not Check The Whole Works?

Does your concern employ an examiner to make periodical inspections of the accounts of chief clerks, cashiers and payroll men?

TOO many people think such examinations are only necessary for the accounting end of a concern. One executive awakened to the possibilities of extending the scope of such examinations to all the operations of his company, and his experience may be found interesting.

He recently visited his X mine and dropped into the office while the examiner was checking the accounts. The timekeeper was one of those frank, outspoken fellows who can say what they think without offense. In a joking way the manager remarked:

"Well, I see they're checking you up." "That's right," was the reply, "but why not check up the whole works? Maybe I'm not the only guy here that needs it."

'But why not check up the whole works? Maybe I'm not the only guy that needs it."

The manager has since told me that he stopped right there and went into executive session. Briefly, the timekeeper directed his attention to the thoroughness with which books and records were checked. Then he warmed up to his job and told the executive why it might pay to check up the work of the others.

"Why not check up your superintendent and mine foreman to see whether they are carrying out your policies or enforcing your rules? Can you feel sure of their work unless you have someone to check it?

"Say! There's enough packing on hand to run the mine five years, and initialed pocket knives and leather pocket books may have had something to do with its purchase. Somebody bought an expensive flue cleaner which was used only once and cast aside. A lot of pipe of special sizes has been lying idle on the job for over a year."

Recalling how he was bonded and checked forward, sideways and backward to guard against fraud in payroll making and paying, he asked the manager if he had ever considered how easily machine coal could masquerade as pick coal by misplacing checks. He showed how the time of inside workmen was kept by a man who worked over an area of several square miles—and that in the dark underground; something that would be considered an impossible achievement with the same area of surface operations.

To cut the story short, this manager on his return asked the auditor for the transfer of the X timekeeper to his department, and he told me that he expected to begin doing some examining work on his own hook in the near future. Maybe he will find it well worth while. At least it looks as if he can't go far wrong in giving it a trial.

Substitutes for Coal in the Andes

By Benjamin L. Miller* and Joseph T. Singewald, Jr.†

SYNOPSIS—The high intermountain plateaus of the Andes are devoid of mineral fuel. Coal and petroleum are imported to a limited extent, but the cost is excessive. Grass, brush, yareta, taquia, turf and peat form the chief fuels used for industrial purposes in these regions.

One of the first requisites for any inhabitable country is an adequate supply of suitable fuel. Without this no region can be properly developed. At one time it was essential that each section should produce all the fuel consumed by it, but with the marked improvement in transportation facilities, almost any part of the world may be called upon to furnish any other section with necessary articles not at hand.

Yet, in spite of the fact that imported materials are obtainable in practically every corner of the world, the economic development of any region requires that so far as possible it furnish its own supply of such necessary products as fuel. Pennsylvania anthracite may be the most desirable fuel in the Bolivian Andes, but owing to the heavy transportation charges, it may be highly impracticable to import it for use. In such a case some substitute must be obtained, either in the form of native products of less desirable character or imports involving lower transportation charges.

While some regions are fortunate enough to have immense supplies of high-grade fuels, most sections must depend upon imports or local substitutes of lower fuel value. The character of the accessible fuels and the cost of transportation are the two factors that ultimately determine the use of any particular variety. In North America the fuel problem has been largely solved, since coal of different kinds is of widespread occurrence throughout the United States and Canada, while excellent transportation facilities enable sections lacking local supplies to readily obtain them at moderate cost. In South America, on the other hand, suitable fuels are less abundant, railroads are less numerous, and their operation is so expensive that freight rates are excessively high. At the present writing the second South American transcontinental railroad is nearing completion. The one already in operation is closed for several months each year on account of the heavy snowfall in the high Andes, and the second one will accomplish little in the reduction of freight rates. Owing to the vast thinly inhabited sections of the continent and the excessive cost of railroad building across the lofty mountains, many years must elapse before South America possesses such a network of railroads as has been developed in North America.

A FRAGMENT OF YARETA, SHOWING ITS CLOSE GROWTH

TWO MOUNDS OF YARETA, SHOWING COMPARATIVE SIZE OF PLANTS

Some Sections Have Abundant Fuel

In South America certain sections are well supplied with fuel, while others, on account of the resources and industries of the countries, demand only small amounts of such material. The great United States of Brazil has abundant wood supplies which have been extensively used, but which in some places are becoming exhausted in the vicinity of the railroads. The burning of wood in the locomotives of the government railroads has contributed to the present state of affairs, which many citizens view with alarm. The coal resources of Brazil have as yet been scarcely touched and furnish reserves which in time will doubtless be utilized in the develop-

*South Bethlehem, Penn.
†Baltimore, Md.

ment of the country even though the fuel is of poor quality.

Uruguay, and especially Argentina, with excellent harbors at their chief ports and railroads radiating therefrom, are able to obtain and distribute imported coal at moderate expense. Further, as these two countries are primarily agricultural, their development is not so intimately connected with a satisfactory supply of native fuel as are some of the countries where mining is the principal industry.

In the West Coast countries the fuel situation is not serious in those portions lying adjacent to the ocean. Southern Chile has adequate supplies of coal, Peru has developed oil resources, and both Chilian coal and Peruvian oil, because of their occurrence near the sea are readily transported to other coast ports. With regard to the high-lying regions inland, however, conditions are strikingly different. Because of the mineral wealth that there lies buried, these are among the most important portions of the continent, and supplies of fuel are necessary for their development.

The Andean plateaus are included within Ecuador, Peru, Bolivia and Chile. They constitute extended areas bounded on the east and west by the two ranges of the Andes, which are known as the Cordillera Real and the Cordillera Occidental. The plateaus are not continuous, but are interrupted by minor mountain masses or by series of great valleys and gorges that have been cut into them, yet all are similar in their essential characteristics.

The High Plateaus Were Formed by Aggradation

The most extensive continuous plateau is that one which contains Lake Titicaca and extending southward, forms the great "altiplain" of Bolivia. These plateaus lie at elevations of 12,000 to 14,000 ft. and slope upward to the inclosing mountains, which contain numerous peaks rising to the height of 20,000 ft. or even more. In the main the plateaus have been formed by aggradation, the result of numerous streams from the bordering mountains depositing their burden of débris in the intervening lower lands.

The great gorge in which the City of La Paz is built has been cut 1,500 ft. into the alluvial materials without exposing the underlying rocks, and it is probable that in places more remote from the mountains, where the original depression was greater, the filling may extend to a depth of several thousand feet. Mountains with all their lower flanks concealed by the alluvium rise above the plateau level in places, like islands in a sea, while lower irregularities have been obliterated. The group of hills at Oruro, which have yielded such large amounts of silver and tin, represent the summits of mountains partly buried beneath sands and gravel transported by streams from the higher land.

The plateaus vary in their appearance. In some places large areas are so flat that the eye can scarcely detect any irregularities, while elsewhere erosion has modified the surface, converting it into series of low rounded hills. At certain seasons the strong winds move the loose sand, and sand dunes are prominent features of the landscape. Crescentic dunes of remarkable symmetry were observed by the writers southeast of Oruro and along the line of the railroad between Uyuni and Atocha.

Although the Andean plateaus lie within the tropics, the climate is always cold on account of the great elevation. There may be said to be but two seasons. From December to April or May, the time of year when most of the rainfall occurs, may be characterized as spring and the remainder of the year as winter. In much of the region frost may be expected every month. In spite of the fact that ice forms almost every night during the winter months, the homes of the people are with few exceptions unheated, because of the high cost of fuel. The people seem to suffer no ill effects from their cold houses, unless it may cause them to close their homes more carefully and secure insufficient ventilation.

From the earliest records, mining and agriculture have been the principal and practically the only occupations of the people of the Andean uplands. Before the coming of the Spanish *conquistadores* the Incas tilled the soil of the more level places and by building on the hillsides the great systems of *andenes* which astonish the modern traveler, they added to the extent of cultivatable land. The principal crops grown are barley and potatoes, while sheep, llamas, alpacas and burros, with some cattle, horses and hogs, are raised.

Under the rule of the Incas mining was also carried on, although not to the same extent that it was after Pizarro's conquest. Gold and silver were sought with ever greater zeal, and the amount of these valuable metals that the country produced added much to the wealth of Spain during many years.

Not since the days of the Incas has mining ceased to be the principal industry, and with each passing year we may well expect to see the mining interests increase in number and value. Excluding the petroleum sections of northern Peru, which occur along the coast, practically all the mines of that country and Bolivia are confined to the uplands.

In Bolivia we have scores of districts where mining has been and is being carried on. Among these are the important tin, silver and bismuth mines of Chorolque, Pulacayo, Huanchaca, Llallagua, Uncia, Huanuni, Potosi, Porco, Oruro and Huayni Potosi and the copper mines of Corocoro, while in Peru are the extensive copper mines of Cerro de Pasco and Morococha, the vanadium mines of Minasragra, besides numerous silver and mercury mines and one remarkable bismuth mine. In Chile the mines of the Andean uplands consist of copper, sulphur and borax, of which the Collahuasi copper mines and the sulphur mines near Ollagüe, Olca and Tacora are the most important.

The agricultural industry requires but little fuel. Most of the people who follow agricultural pursuits are Indians, and the only fuel required is for the purpose of cooking their food. The cooking, which is done by means of small earthenware stoves, is extremely limited, and the total amount of fuel used by the Indians of the Andean plateaus is not great.

Mining Industry Requires Fuel

On the other hand, the mining industry and the railroads dependent upon it require a constant supply of suitable fuel. In a few places water power has been utilized, but the amount available within a reasonable distance from the mines is limited, and the cost of installation of the necessary equipment in distant and difficulty accessible locations is prohibitive. The Cerro de Pasco Mining Co. has recently installed a hydroelectric plant that has materially reduced its fuel con-

sumption, while a few other plants utilize water power, but many of the important mines are situated in places where hydro-electric power will never be available, as the nearest sources are the distant eastern slopes of the Andes, where the amount of rainfall is greater.

While imported fuels can be obtained by most of the industries of the high plateaus, the prices are in many places excessive. The expense of operation of the railroads is extremely great on account of the steep grades, which in some instances are so heavy that only three cars can be hauled by one engine. The result is that fuel from other countries, brought to the ocean ports and then transported inland to the plateaus, must be sold at exceptionally high prices. For example, Welsh coal sells in La Paz for $50 to $60 per ton, while in regions remote from railroads the prices are much higher. Petroleum is likewise expensive, while wood would never be imported for fuel because of its lower fuel value.

Charcoal and some wood are brought on the backs of llamas and burros from the lower-lying regions on the eastern flanks of the Andes, but at such cost that they are

LLAMAS BRINGING YARETA TO A SULPHUR MINE IN CHILE

almost as expensive as the foreign coal and petroleum brought to the plateaus by boat and train.

In spite of the cost of foreign petroleum and coal, these are extensively used. Most of the Andean railroads use Welsh, Australian or American coals, or Peruvian oil, while several mining companies are buying oil to make up the deficiency in the local fuel supply, and other companies are installing Diesel engines and will use oil from either Peru or California.

The necessity for large supplies of fuel and the excessive cost of transportation have compelled the companies operating in the high Andes to make use of materials that elsewhere would scarcely be regarded as fit for fuel. In few other places in the world has there been such complete utilization of all the fuel resources as obtains in the plateaus of Bolivia and Peru, and they therefore stand apart as an object lesson to other regions where the question of the fuel supplies of the future is now beginning to attract attention.

The local fuels of the Andean plateaus, where coal is not found, consist of grass, brush, yareta, taquia, peat and turf. Some of these products are of little importance, yet in taking an inventory of the supplies all should receive attention.

On the high wind-swept pampas where trees cannot grow, there are many varieties of grass, some of which are very rank and form large compact bunches of coarse stems. The Indians make use of this grass for cooking their simple food, but naturally it is a poor fuel and cannot be utilized by large enterprises, although it has been used at Huancavelica, Peru, in the metallurgical process of obtaining mercury from the cinnabar ores.

In some places in the antiplain of Bolivia and in the Peruvian plateaus, especially along ravines and gorges where there is more moisture, many varieties of small shrubs grow. This brush is collected, brought many miles to market on the backs of llamas, or at times carried by the Indians themselves. Near the towns and cities of the Andean uplands all firewood was long ago exhausted, and one can frequently see llamas with loads of brush or faggots of enormous size brought from distances so remote that almost a week is required for the round trip. Brush and charcoal are common articles offered for sale by the Indians in the Sunday morning markets. While of greater fuel value than the grass, on account of the small size of the stems the brush burns very rapidly and is of little value except for domestic purposes.

The Yareta Plant as a Fuel

The yareta is the most valuable plant growth used for fuel in the Andes. Under the common name of yareta are included several species of plants belonging to the genus Azorella. This genus is represented in almost all parts of the world, but the high lands of Chile, Bolivia and Peru contain the species called yareta that, except to the botanist, show little resemblance to the species found elsewhere.

Yareta grows on rocky slopes at elevations of 13,000 to 17,000 ft., considerably higher than most other kinds of plants. Mosses and other forms of inconspicuous plants are the only ones found in association with the yareta. In general shape it suggests heads of coral growing upon and conforming to the configuration of the rocks. The rounded pillowy-like masses also suggest the backs of sheep, and hence the Indians named the plant yareta, which in the Quechua language means "vegetable sheep." The outer surface is bright green and suggests a soft spongy mass, like a great clump of moss, so that one is surprised when he first steps on one of the hummocks and finds it practically as hard as a board.

The central root twists and turns as it pushes its way between the rock fragments to the limited amount of soil that has collected in the small openings between the rocks. The largest masses observed were approximately 4 ft. in diameter and about 1½ ft. thick. It consists of closely compressed coarse woody branches, and the large mass is produced by repeated branching. All branches keeping pace in their growth form the symmetrical and attractive heads or clumps, each of which consists of a single plant. The branches are intergrown and pressed together so compactly that one cannot separate them by the hands alone nor could he force a stick far into the mass.

In the Bulletin of the Missouri Botanical Garden (Vol. 3, No. 4) is a botanical description from which the following statements are taken: "The flowers of the yareta are tiny, only about two millimeters, or less than ⅛ in., long, and are borne in small sessile, axillary, involucrate clusters near the tips of the branches; and the fruit is somewhat like a miniature caraway seed.

Like other members of the Umbelliferæ—the natural family to which the plant belongs—the younger branches are rich in oil-secreting cells and oil tubes, so that the whole structure becomes completely infiltrated with a resinous content. The dried specimen at hand has much the odor of old honeycomb or beeswax." The resin frequently exudes and flows down the surface, where it hardens as does the gum on a tree. The high resinous content adds greatly to the fuel value of the plant. When thrown into the fire, the resin ignites quickly and burns rapidly with a bright flame, while the woody fibers of the plant are consumed more slowly.

By means of crowbars the masses of yareta are uprooted and pried from the rocks and thrown into heaps where they are allowed to dry for several months. The green yareta will burn on account of the resin present, but naturally it is improved by drying. It is transported on the backs of llamas to the mining camps. Where the larger masses are found, a llama will usually carry two plants, each weighing from 40 to 50 lb., which are tied on either side of the animal by ropes made by the Indians of llama wool. Where the masses are too large to be placed in the stoves or furnaces, they can be easily broken into smaller pieces by means of a hatchet or ax.

The yareta yields a large amount of ash and has a fuel value of about 3,000 B.t.u. per pound, making it about one-fourth as efficient as ordinary bituminous coal. It is not shipped by rail on account of the high freight charges on the railroads in the Andes, consequently the price in any locality depends entirely upon the supply and the local demand. In the vicinity of Tacora, Chile, where the mining and refining of sulphur has been started since the completion of the Arica-La Paz R.R., one company is able to buy yareta from the Indians at the rate of approximately $1 a ton, while at Potosi, Bolivia, where mining has long been carried on and the yareta in the immediate vicinity practically exhausted, it commands about $4.20 a ton.

Unfortunately the yareta is of slow growth, and whenever any large industry is dependent entirely upon it, the supply within easy range is certain to fail within a few years. Some years ago a borax company with its plant located at Cebollar, on the borders of one of the borax lakes of northeastern Chile, built an aërial tram several miles in length for the purpose of bringing the yareta to the mill. The supply accessible to the tram line was soon exhausted, imported coal was substituted and the expensive tram is idle, while many years will elapse before a new yareta supply is available.

It is no exaggeration to say that the yareta of the Andes has been the salvation of certain mining districts. It is the only fuel used in the refining of sulphur in the mining district of Tacora, Chile. It is also extensively used at the Collahuasi copper mines, and the tin and silver mines of Huanuni, Porco, Potosi and other Bolivian mining districts.

Llama Dung as a Fuel

The most extensively used fuel throughout the Andean plateaus is taquia, the dung of the llama. It is used for cooking, for drying ore concentrates, for boilers, for roasting ores, and even for smelting. A person who has long lived in Bolivia estimates that this material constitutes 95 per cent. of the fuel used in the high-lying regions of that country. In sacks containing approximately 100 lb. the taquia is brought on the backs of llamas to the towns and to the various mining plants from all parts of the plateaus.

The taquia is usually collected in the corrals where the llamas are kept during the night, but it is not an uncommon sight to see Indian women scraping up the black pellets from the roads or trails. In appearance it is similar to the dung of sheep except for the somewhat larger size of the individual particles.

The value of the llama to the mining industry of the Andes can scarcely be overestimated. In places remote from the railroads llamas furnish the sole means of transportation; taquia is the only fuel used; llama wool is woven for the manufacture of the sacks in which the taquia and other articles are carried; ropes of llama wool bind the burdens to the backs of the animals; while in addition the wool of the llama supplies the material for the ponchos of the Indians who own the animals and llama flash is used for food. Probably no other domesticated animal contributes in such a varied way in the development of the industries of a country.

The heating value of taquia is about 4,000 B.t.u. per pound, or approximately one-third the efficiency of ordinary bituminous coal and more than that of yareta. The material is not shipped by railroad, but may be carried by llama trains a distance of 40 to 50 mi. The price varies greatly with the local supply and demand. In one of the mining camps near the base of Huayni-Potosi Mountain, Bolivia, taquia can be obtained for about $1.50 a ton, but at Corocoro and Potosi it commands a price of $3 to $4 a ton or even more. Where two or more mining companies using taquia are located in the same vicinity, the competition is keen and the price is correspondingly high.

Deposits of Peat and Turf

There are a few deposits of peat or partly decomposed turf which have a slight local importance. They are found in places where marshy conditions have aided in the growth of moss and other vegetation, which has accumulated to form a layer from a few inches to a few feet thick. There is apt to be considerable dirt mixed with the vegetable débris so that its fuel value is greatly reduced. At Milluni, Bolivia, some of this peat or turf is dug and used for drying the ore concentrates.

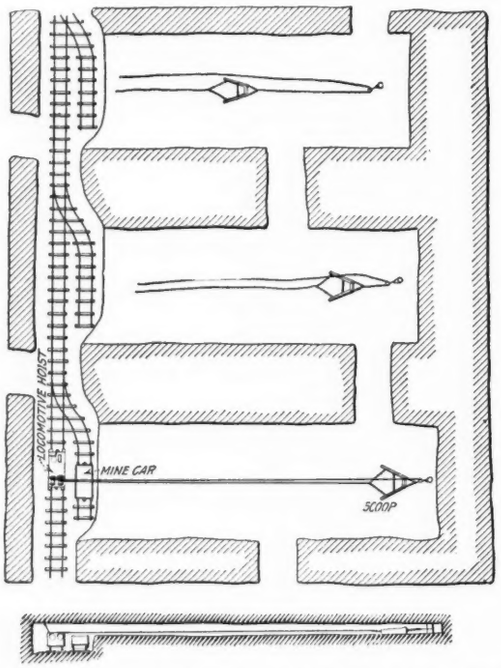
The present outlook for the fuel situation in the Andean plateaus in some respects is discouraging in that the supplies of most of the fuels described are limited. The brush and yareta are being consumed faster than replaced by new growths, and the annual production of taquia remains fairly constant. At the present time the development of some promising mineral deposits is being hindered by the scarcity of local fuel supplies. In parts of the Peruvian plateaus more coal mines will be opened as the fuel demand increases, but the lack of any longitudinal railroad line in the Andes prevents other portions, particularly the Bolivian plateaus, from sharing the benefits resulting from the further development of the coal resources. In a few places hydro-electric power will furnish a substitute for fuel, but in many regions arrangements must be made for the importation of foreign fuels. Many mining companies are already using Diesel engines burning Peruvian or California oil, and other companies are planning for their installation in the near future.

Scraper Mining for Low Veins*

SYNOPSIS—The Lehigh Valley Coal Co., after many experiments, seems to prefer its new method of coal scraping to all others when extracting thin beds of coal. It is using a locomotive winch to drag and place the V-scraper.

An economical method of mining thin, flat seams of anthracite has been devised by the Lackawanna Division of the Lehigh Valley Coal Co. The new, or scraper, method, has already proved its value and is beyond the experimental stage.

The mining of thin, flat veins in the anthracite coal region has always been costly on account of the large amount of rock that must be mined with the coal. The



PLAN AND ELEVATION, SHOWING OPERATION OF SCOOP

time, money and energy spent on mining this dead rock and then in piling it on huge rock banks on the surface are all wasted. This same difficulty is met with in the coal regions the world over, and until recently no satisfactory method had been devised whereby these thin, flat seams of coal could be won profitably or without removing large quantities of rock.

Various systems have been tried and advocated, such as small "buggies," chutes and low, extensible conveyors, but a few months' or a half-year's trial would reveal one weakness after another until these devices were proved impracticable. For a while it was thought that the low veins of coal were doomed to remain in their beds until all the present-day workable seams were exhausted and until an increase in price caused by the scarcity of anthracite would permit the mining of the thin seams in the ordinary way.

But George P. Gallagher, assistant superintendent of the Lackawanna Division, after two years of continual experimenting, recently announced that the "Fifth vein" or the top split of the Red Ash at Seneca colliery, Pittston, Penn., and the Bottom Ross vein at Maltby colliery, Swoyersville Borough, which are both thin seams, have been worked successfully for the past two years. It seems almost incredible that these flat veins of coal can be worked profitably, but the scraper method has proved to be successful, and now a large quantity of coal which has been heretofore considered irredeemable is being mined satisfactorily.

Coal Is Mined Without Removing Any Rock

The plan of working the thin veins is the same as is pursued in the development of thicker seams—the room-and-pillar system with 50-ft. centers and 24-ft. breasts—modified, however, somewhat to comply with local conditions. The system of ventilation is also similar, with brattices and crosscuts. No rock is lifted, and the miner spends all his time cutting coal.

To extract the coal, the miner advances to the face on his hands and knees. The ordinary hand drill is used for drilling the shot holes, which are fired off the solid. Holes are drilled about 3½ to 5 ft. deep, and because it is hard in such a low seam to hurry away from the face after lighting a fuse, an electric battery is used to fire the charge. Under ordinary conditions a skillful miner can produce an average of 5 or 6 tons of coal a day.

Success in the mining of the thin flat veins of coal lies in the use of a sheet-iron scraper invented and developed in the Lackawanna Division by Mr. Gallagher with the assistance of Division Engineer H. H. Otto, Master Mechanic Pierce Robinson and John Ridgley, mine foreman at Seneca colliery.

It consists of two legs of ⅛-in. sheet iron about 4½ ft. long, properly shaped and fastened with heavy iron hinges to a small square back sheet about a foot wide. The two legs of the scraper swing open and closed like the wings of a bird. To prevent the legs from opening too wide, a ⅜-in. chain about 8 ft. long is bolted to the ends of the wings. At the center of this chain is attached a ½-in. steel-wire haulage rope, which drags it along. This rope is also attached to the back so that it can be pulled backward as well as forward.

Scraper Pulled by a Winch on a Locomotive

The method of using the scraper is as follows: An eye-bolt, holding a pulley, is driven in the roof near the face, close to the rib of the chamber. Sometimes this pulley is fastened to a prop near one side of the face. In any event it is moved forward as the face advances. Its purpose is to pull the scraper back to the face for a load of coal.

At the foot of the breast, close to the rib of the gangway, two pulleys are stationed as long as the breast is being worked. One of these is used to guide the rope that pulls the scraper back up the breast, while the other, which is close by, is used to pull the scraper into the mine car standing at the foot of the breast on a side branch off the gangway road. A mule or locomotive

*From the "Employees' Magazine" of the Lehigh Valley Coal Co., April, 1916.

may be used to pull the ropes that drag the scraper back and forth. On reaching the face of the breast, the miner places the scraper behind the coal that has just been blown down. The front rope then pulls the scraper along the floor of the breast and draws everything in front of it down to the gangway, at which point the coal passes over a loading platform into the mine cars. Each scraper-load weighs about 800 lb. and five scraperfuls will about fill a mine car.

The accompanying sketch shows the haulage arrangement at Seneca colliery, where the scraper was tried out about two years ago, Jan. 15, 1914. The scraper was built in the blacksmith shop of that colliery and has been in constant use to this day. Double-drum electric haulage engines are now being used in place of mules to pull the scraper back and forth.

At Maltby colliery a special scraper-haulage, electric, portable, double-drum engine mounted on an electric locomotive is being designed for this work and will replace the previous mule power. The collieries that are now using the scraper for mining low veins successfully are Seneca, Maltby, Stevens and Exeter, all of the Lackawanna Division.

Economy of Scraper Method of Coal Mining

A big saving is made by the use of this scraper method of mining when the coal is thin. To mine a thin vein of coal it is necessary to blast at least 3 or 4 ft. of solid rock in order to gain sufficient height to clear the miner, the mules, the haulage locomotives and the mine cars. This 3 ft. of rock, under the scraper method, remains in the ground untouched, thus saving the cost not only of blasting, but also of transporting the rock to the dump on the surface. Then again, when the miner's time is not taken up with rock work, he has that much more to devote to cutting coal, which is really his proper occupation.

Other items of economy worthy of consideration are the saving in various materials and supplies. As the chambers are not so high, much less timber is used for props and brattices, and since there is no need of rails, ties and spikes, the cost of these materials is entirely eliminated.

Quarry Storage of Coal

Some of the large coal consumers of Chicago are making use of worked-out limestone quarries which are found in the vicinity of the city in which to store coal under water.

About 25 mi. southwest of Chicago, at the village of Lemont, Ill., on the Chicago & Alton R.R., this method of coal storage can be seen in practical operation. This particular quarry averages about 25 ft. in depth and generally has from one to two feet of water standing all over its surface.

The coal that has been put in storage here during the last summer has all been screenings received in regulation railroad hopper cars and sidetracked along the edge of quarry, where they are unloaded. From this point the screenings are flushed into the quarry by water. It is the intention to reclaim the screenings in a similar way by using a suitable type of suction pump. When the storage is completed, the surface of the coal will be covered by at least a foot of water and thus the fuel will be protected from spontaneous combustion.

Extracts from a Superintendent's Diary

Seven of our citizens are making preparations to present themselves before the next examining board for certificates of competency as mine foremen. Almost every evening these seven men meet in the bedroom at the back of the commissary to receive several hours' instruction in the theory and practice of mine surveying, mine gases, etc., from Ned Boyd, one of the commissary clerks, the occupant of the bedroom.

Ned knows nothing whatever about the theory of mining—or the practice either, for that matter—but he is long on the theory and practice of figures, and he has demonstrated several times during the past few years that he is an excellent tutor for men preparing to pass mine-foremen examinations. In all, he has coached at least forty men for such examinations, and only two of them failed to pass.

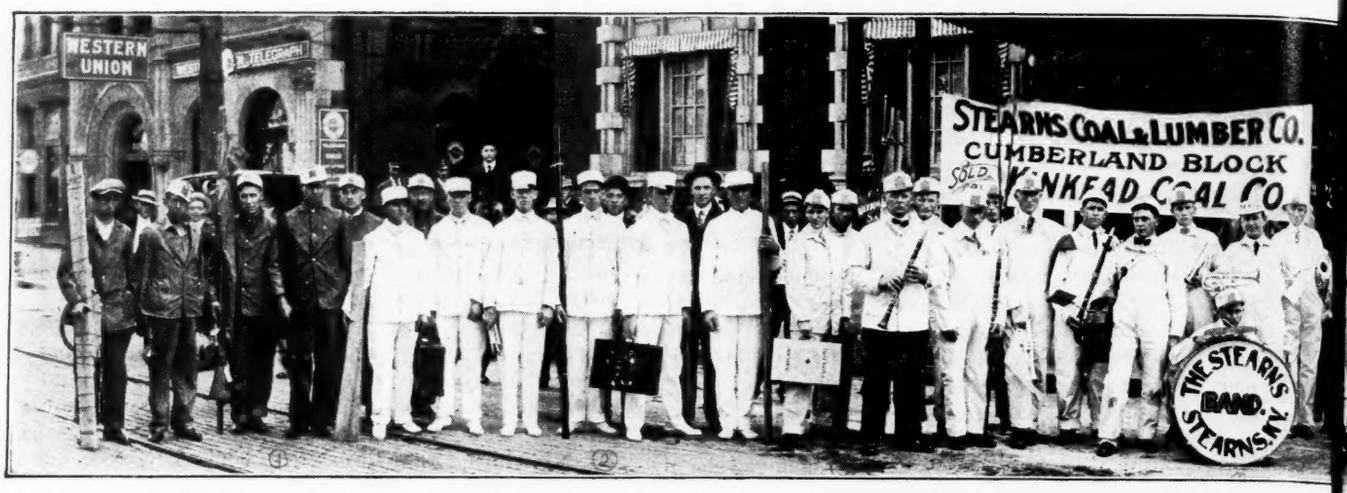
Enrolled in his present class he has a pupil who keeps him in hot water most of the time because of the fool questions that he asks, coupled with a bull-headed determination to argue all questions to a definite conclusion. Very often Ned and the six other pupils take sides against the bull-headed fellow in an attempt to convince him that all questions relating to the theory of mining do not permit of positive yes or no answers, but they meet with poor success, and occasionally they get so badly worked up during the controversy that they all go home in disgust. That is exactly what happened tonight, and after it was all over, Ned came in to tell me of his troubles.

It seems that they had up for discussion the question of the advisability of spraying mine workings to overcome the danger from dust, and Sim Davis, the bull-headed one, was as usual opposed to the ideas of the other six. Ned, in desperation, tried to end the argument by assuring his pupils that the examiners rarely asked the applicants to give an opinion as to the advisability of carrying out methods that were already in common use, but Sim took exception to that remark also, and then it was that all the others decided that they might as well go home.

Reading between the lines, I gathered that Ned was more than glad to conclude his instruction for the night, since he knows very little about the subject that they had up for discussion.

His remarks recalled to my mind the questions put to the men who first suggested humidifying mine air. They had to answer arguments that ran like this: Most mining companies are spending thousands of dollars trying to get control of the water in their underground workings; a few have actually succeeded so well that you can't find a drop of water in their workings, except of course the small amount that drips from the roofs in the workings. Now do you fellows mean to tell us that these companies, after accomplishing that, are going to turn around deliberately and pump water back into their workings? And after getting rid of all of the troublesome steam pipes in the mines by substituting electric transmission, do you think that they are going to experiment with steam jets in the intakes, when they have learned through bitter experience just what steam will do to their mine roofs?

If we balked at formidable questions, how far would any of us get?



CONSOLIDATION COAL CO., JENKINS, KY. LICK BRANCH COAL CO. TEAM, COXTON, KY. STEARNS COAL AND LUMBER CO., FIRST-AID TEAMS AND BAND LINED THEMSELVES UP BEFORE THE PHOENIX HOTEL AND WERE PHOTOGRAPHED

Kentucky Mining Institute

By Ivan P. Tashof*

SYNOPSIS—A successful convention in which excellent papers were combined with a first-aid meet. Stearns Coal and Lumber Co. team of Stearns, Ky., wins all the first honors.

The fifth annual meeting of the Kentucky Mining Institute was held in Lexington on May 12 and 13, 1916, with about 200 members present. The Friday morning session, held on the University of Kentucky campus, opened with an excellent paper on "Cost Accounting," by R. C. Thomas, superintendent of the North East Coal Co., Paintsville, Ky. Mr. Thomas ably presented the principles underlying and controlling the correct keeping of mine costs.

G. M. Gillette, general manager of the Jenkins division of the Consolidation Coal Co., followed with an illustrated talk on the recent fire at mine No. 215, Jenkins, Ky. Mr. Gillette showed a plan of the mine, and the audience easily followed his description of the methods used to get the fire under control. A number of slides were shown of the condition of the mine immediately after the fire. This paper concluded the morning session.

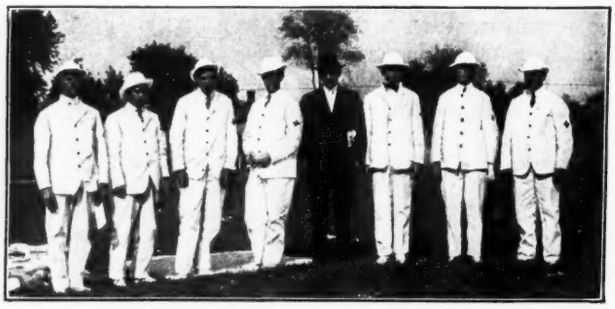
The afternoon session was opened with a paper by C. J. Norwood, chief inspector of mines for the State of Kentucky and dean of the College of Mines and Metallurgy of the University of Kentucky, with a paper entitled, "Some Notes on Byproduct Coking." Professor Norwood by frequent reference to charts and maps showed the numerous byproducts of coking and at the same time gave some idea as to what uses these can be made to perform.

Andrews Allen, of Chicago, Ill., closed the afternoon session with an illustrated lecture on the "Preparation of Coal." Mr. Allen's address was divided into two parts—first, cleaning the coals so as to remove dirt and foreign substances, and second, the sizing of coal so as to adapt it to the demands of the market.

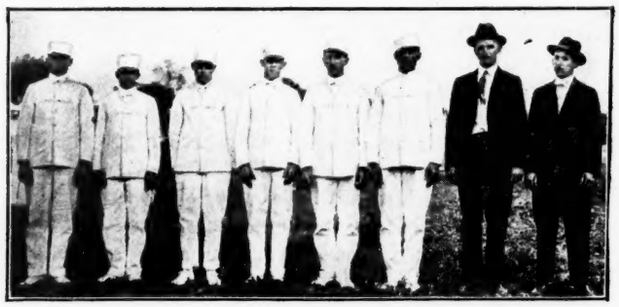
On Tuesday evening, Robert E. Caldwell, formerly assistant attorney general for the State of Kentucky and now on the Kentucky Workmen's Compensation Board, explained the compensation law which was recently enacted by the legislature and which goes in effect Aug. 1, 1916. A large assemblage of mining men, to whom compensation is of paramount importance, heard Mr. Caldwell's address. At its conclusion the merchants of the City of Lexington tendered the members of the Institute and their guests a smoker.

On Saturday morning, through the courtesy of the Lexington Board of Commerce, the members of the

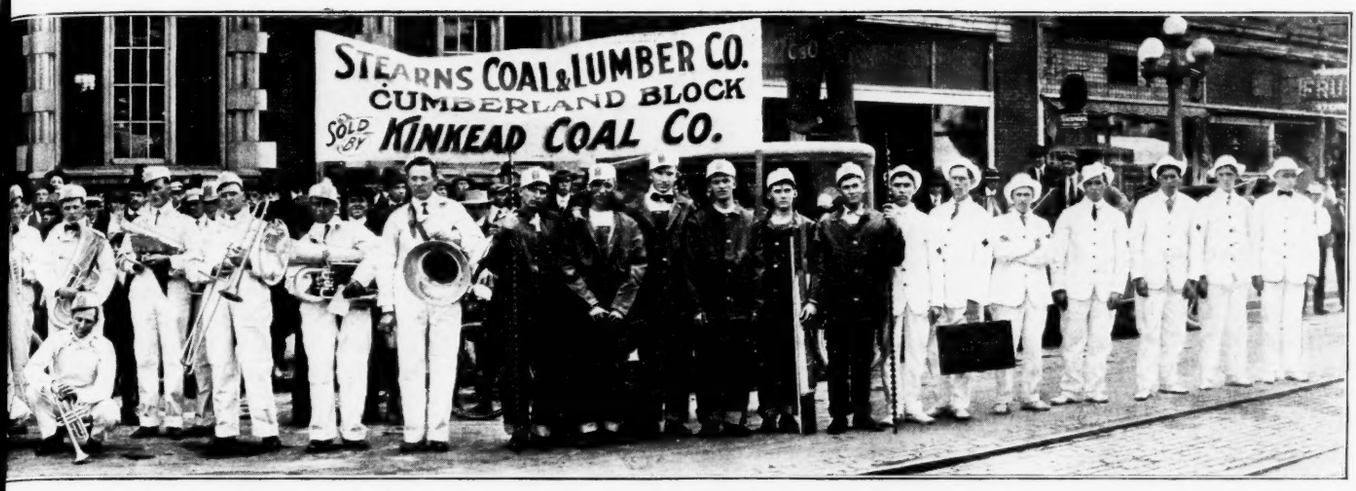
*Secretary-treasurer, Kentucky Mining Institute, Lexington, Ky.



PIONEER COAL CO.'S TEAM OF KETTLE ISLAND, KY.



TEAM OF LICK BRANCH COAL CO., COXTON, KY.



TEAM AND BRASS BAND, STEARNS, KY. NORTH EAST COAL CO. TEAM, PAINTSVILLE, KY. PIONEER COAL CO. TEAM OF KETTLE ISLAND, KY.

BEFORE THEY WENT INTO ACTION IN STOLL STADIUM—KENTUCKY STATE-WIDE FIRST-AID CONTEST

institute and their guests were taken on an automobile ride to Walnut Hall, one of the great stock-breeding institutions of the blue-grass region of Kentucky. They returned at 10 a.m., at which time the business session was held.

The following officers were elected for the ensuing year: J. E. Butler, president, Stearns, Ky.; Ivan P. Tashof, secretary-treasurer, Lexington, Ky.; Joseph W. Reed, assistant secretary-treasurer, Lexington, Ky.; and vice-presidents, K. U. Meguire, Coxton, Ky.; H. M. Ernst, Sturgis, Ky.; H. D. Easton, Straight Creek, Ky.; C. W. Taylor, Greenville, Ky.; R. F. Cole, Fleming, Ky.; B. R. Hutchcraft, Lexington, Ky.; H. G. Van Hoose, Majestic, Ky.; W. A. Miller, Cincinnati, Ohio.

The first-aid contest was held Saturday afternoon under the joint auspices of the United States Bureau of Mines, the American Red Cross and the Kentucky Mining Institute. E. B. Sutton, of the Birmingham division, represented the Bureau of Mines and supervised the details of the meet.

The following doctors from Lexington judged the contest: J. W. Pryor, B. F. van Meter, G. H. Wilson, S. B. Marks, D. W. Barrow, C. A. Vance, L. C. Redmon. The recorders were all Lexington men: R. D. Quickel, chief; S. L. Dorsey, S. J. Caudill. The officers in charge of the field were: T. W. Reed, Lexington, Ky.; H. D. Easton, Lexington, Ky.; Walter Wells, Prestonburg, Ky.

The team representing the Stearns Coal and Lumber Co., of Stearns, Ky., captured first prize in every event.

The winners in the three events were as follows:

Full Team Event—(1) Stearns Coal and Lumber Co., (2) and (3) Lick Branch Coal Co., North East Coal Co., (4) Pioneer Coal Co., (5) Consolidation Coal Co. The teams of the Lick Branch Coal Co. and of the North East Coal Co. tied for second and third prize. On the toss of a coin the second prize was given to the former.

Two-Men Event—(1) Stearns Coal and Lumber Co., (2) Pioneer Coal Co., (3) Lick Branch Coal Co., (4) Consolidation Coal Co., (5) North East Coal Co.

One-Man Event—(1) Stearns Coal and Lumber Co., (2) Pioneer Coal Co., (3) Consolidation Coal Co., (4) Lick Branch Coal Co., (5) North East Coal Co.

H. M. Wolflin, of the United States Bureau of Mines, presented the prizes.

[It is reported that the Kentucky Mining Institute yielded to the solicitations of the Cincinnati Chamber of Commerce so far as to express a preference for Cincinnati as the place of meeting for the winter session. The matter was, however, left to the executive committee for final decision. The action of the West Virginia Coal Mining Institute had not then been taken. That institute decided that Huntington, W. Va. promised such an augmentation in membership that it was a mistake to meet outside the state. In the illustration at the foot of the page from left to right will be found J. E. Butler, Ivan P. Tashof, Joseph Reed and Prof. C. J. Norwood, chief inspector. The latter has been a mainstay of the institute from its inception.—Editor.]

SOME OF THE NOTABLES IN THE ACTIVITIES OF THE KENTUCKY MINING INSTITUTE

Duties of a Coal Mine Inspector*

By P. A. Grady†

SYNOPSIS—Some pertinent comments an the desirability of company mine inspectors and their duties. Inspectors can do much to reduce accidents, effect savings in different ways and increase the operating efficiency.

Greater safety in coal mining is today receiving more attention from progressive operators than it ever did before. They not only want their mines to comply with every statute of the mining law, but wherever necessary for the greater safety of their workmen, they even adopt methods and practices that exceed these requirements.

With this in view, they employ their own inspectors, so that closer and more frequent inspections may be given their mines than it is possible for the state inspector to do. It must be conceded that our State Mine Department has done much good work in recent years to better the condition of coal mines, and our operators, recognizing this work, wish to coöperate in every way possible with the department.

The first duty of the company inspector is to secure safety, to inspect the mines as frequently as possible, to report on the conditions and make recommendations that will increase the safety of the mine. With such information in hand it is then possible for the management to start down the line of officials and workmen and put into practice the methods and discipline necessary to secure the desired safety.

Miners To Blame for Accidents

In the operation of a coal mine, a perfectly worked-out plan of mining can be laid down and rules and regulations adopted that, if strictly adhered to, would reduce accidents to a minimum and bring the safety of the mine to the highest point; but after such plans are worked out, the results depend on every individual in and connected with the mine.

The mortality tables show that the occupation of a coal miner is healthy, but dangerous, due largely to the risks he takes. A careful study of the records will also show that by far the greater percentage of the accidents are avoidable if the proper precautions are taken and the necessary discipline is in effect.

Constant familiarity with the dangers in a mine often breeds a spirit of recklessness and contempt for risks. The miner's work is almost universally piece or contract work, and it resolves itself into the question of expending labor in making the place safe or of neglecting it in order to increase the earnings of the day, and in so doing he gets caught by the dangers which he did not remove.

The excavating, or advancing, of the working places in a mine is continually exposing the miner to new dangers. In a great many cases he is left to his own judgment in dealing with them, and he is not impressed often enough with the risks he is taking. Therefore, the whole question of safety reduces itself to the matter of supervision by officials who have been properly trained to look after the safety of men and to enforce the discipline necessary to secure it, to be able to impress upon the workmen the gravity of the risks they are taking, and that the only time in which to remove a danger or to make a place safe is right then.

To do this, frequent visits must be made by these officials to every working place, and when a danger is noticed they should see that the workman starts to remove or remedy it before they leave that place. Too many officials content themselves by telling a miner that the roof is bad, making a chalk mark on the roof under which a post should be set, and then immediately leaving for another place. A hurried call for a stretcher on which to carry an injured or dead miner out of the mine often shows that the chalk mark failed to prevent an accident. A slogan heard in some mines now is: "Chalk marks will not hold up bad roofs, and they should not be made." It should come into more universal use among mine officials in general. Instead of hurrying from one place to another, if enough time was spent, wherever a dangerous condition is observed, to see that it is made safe or removed, there would be fewer accidents. Nothing short of discipline military in character will ever reduce accidents to a minimum, and the time is rapidly passing away when the blame for an accident can be put on a dead man.

Economical Mines the Safest

It is not the "green" miner who gets injured. Our state statistics show that by far the greater percentage of the men killed or injured in the mines have had an experience of over two years in mining coal. They seem to be men who have been mining a sufficient length of time to become accustomed to the dangers, but have not received the proper instructions as to how to avoid these dangers; nor have they been sufficiently disciplined. In fact, it might be stated that the great bulk of our American workmen are not amenable to discipline and they chafe under the restraint [illegible] by measures initiated for their own safety and good.

It matters little what improvements are put into a mine, what laws are passed or what rules are established, if they are not enforced. It is therefore necessary for the inspector to see that the proper officials are doing their duty; that the needed provisions are made for health and safety, and if not, to report to the person in authority in order that they may be corrected.

To anyone who has visited a large number of our mines it is a noticeable fact that those which have the lowest mortality record are those that are the most successful and prove the best investments to their owners. A mine that is in perfect running order as regards health and safety is also found to be economical. This does not mean that the workmen earn less; in fact they are able to earn more by the improvements which make it possible for their work to be conducted in a more regular and systematic manner.

The managements of such mines know that in order to bring about such conditions they must follow the best plan of mining suited to their natural surroundings;

*Read before the meeting of the West Virginia Coal Mining Institute, Bluefield, W. Va., June 2, 1916.

†Inspector of Mines, Collins' Interests, Bluefield, W. Va.

that they must have the most efficient machinery with which to mine and transport coal; that the track must be of the best; that the electric installations must be good; that it is necessary to arrange their working places in such a way that the greatest number of miners can be served and given all they can do, and that the other workmen perform an amount of useful labor commensurate with the wages they receive. They know that a busy workman is a contented person. They also want to prevent equipment and material from lying around in sections not working, where it is left to rot and rust or to be buried under roof falls without giving proper returns on the investment.

Duties of the Inspector

The inspector is, therefore, required to note carefully every existing condition that affects mining and tabulate them in a concrete form or report that will be of some value to the management. In doing such work any person will be inclined to criticize, but if such criticism is along constructive lines, he is of some worth to his employers.

If the plan of mining followed is not considered the best, one that is known to be successful under the same conditions should be outlined and recommended. No one company or its officials know all of what is best in mining, so its officials should be permitted to examine other mines. Where a company owns more than one mine, the interchange of visits by the foremen will result in the discovery of practices which will work to the benefit of all concerned.

Careful notice should be taken of all machinery, such as haulage motors, cutting machines and pumps, to see that they serve the greatest number of miners possible and handle all the tonnage available. The number of miners working in each section should be taken into account and the number of company men that serve them. It is often the case that there is not a sufficient number of miners employed in a certain section to enable t' machinery to work to a high productive point, and to get from the daymen an amount of labor commensurate with their pay. A concentrated syst[illegible] of mining that prevents the work from being carri[illegible] a scattered area, is to be recommended in ord[illegible] efficiency in operation may be secured.

Prevention of Leaks

Electric power has come into general use in our mines, and in its conduction and application there are many factors that have a direct influence on its cost. We may not be running enough copper wire into the mine to conduct the power properly, and the loss in resistance is great. The wires may not be properly insulated from coming in contact with the roof, ribs or posts, and there is considerable loss in grounding, or enough attention may not be paid to broken bonds in the track. If more attention was given to all of those things, the power bills would decrease. Always prevent as far as possible high resistance and poor insulation, which will more than pay for the money and labor expended.

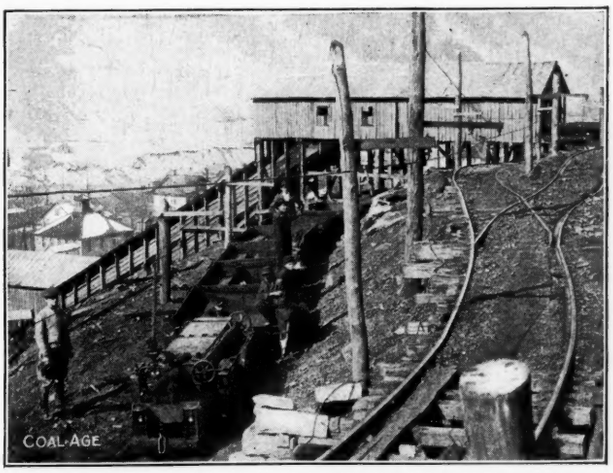
It was not until we had power bills presented to us each month that we fully realized what the power for one item—such as ventilation, for instance—amounted to. We found out that the cost for current for the fan motor alone ran from $2,000 to $5,000 per annum. By providing more airways, cleaning up the ones already in use and preventing leakage of air through doors, stoppings and overcasts, the cost of fan power has been reduced in many mines by more than half. As with the conduction of the electric current, we are trying to conduct air through the mines with the least resistance and leakage, and the enormity of the monthly power bill is our greatest incentive to do this.

It would be surprising to a great many mining men if they were presented with an inventory at the end of each year of the amount of material and equipment, such as mine rails, ties, posts and spikes, that decay or are lost in their mines each year. If proper inspection had been given these mines to see that this material was recovered and used, the number of cents saved for supplies would more than equal the mills paid for inspection.

On the Matter of Conservation

Our coal properties now are mining the best seams of coal we have in the state. These seams will net a greater profit to the operators than will the thinner ones to be developed later on, so the inspection of the operating company on the recovery of coal should be close enough to see that every available pound is removed. We should quit dealing in percentages of recovery and look to effecting an absolute recovery—not only get absolute recovery, but recover it in such a way that we will get from the pillar coal as good a marketable coal as to sizes as from the first mining.

It was a common thing for a state mine inspector a few years ago, in reporting the pillar conditions in a mine, to state that, on account of the weight thrown on the coal, little if any shooting was required, and all the miner had to do was to pick the coal and load it out. The foremen in such mines often boasted of how nice the pillars worked. They did not consider that such easy mining coal was nearly all "slack" commanding a much lower price than the other grades of coal. This was due to the small pillars which had been left in performing the first mining and to the poor method adopted when the pillars were being extracted.



TIPPLE OF H. T. WILSON COAL CO. OF DETROIT, MICH.
This plant is in the city limits of Logan, W. Va.

Steep-Seam Longwall in Illinois

By C. A. Herbert*

SYNOPSIS—Description of an unusual system adopted where the coal seams are badly folded by the La Salle anticline. The dip varies from 4 to 40 deg. and the roof is rather difficult to handle.

The Deer Park mine of the Illinois Zinc Co., located about 4 mi. southeast of La Salle, Ill., presents an interesting problem in longwall mining which has been worked out by J. A. Ede, the company's consulting engineer.

The mine is working in the No. 2 seam of the Illinois series, and is worked on the longwall advancing system, as are all the other mines in this field. This mine is of particular interest because of its proximity to the La Salle anticline, which runs in a southeasterly direction through this part of the state and because the measures are badly folded. The seam, instead of being practically flat, as at other points where it is being worked, dips to the southwest at an angle varying from 4 to 40 deg.

The mine is entered by a slope, which follows the coal from the outcrop to the bottom of the steep part of the fold, a distance of about 3,000 ft., the slope being driven at an angle with the dip to lessen the grade. The upper and lower parts of the mine, where the dip runs from 4 to 10 deg., are worked on the longwall advancing system universal in this field, while the steeper portion is worked in panels. Fig. 1 is a plan covering the two systems, while Fig. 2 shows a plan and section of the panels.

In the steep section parallel roads are kept open at nearly right angles with the dip, from 80 to 100 ft. apart, the ground between these headings being termed

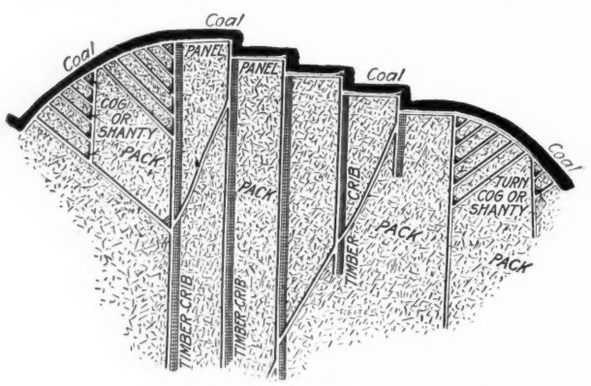


FIG. 1. PLAN SHOWING SYSTEM OF WORKING

panels. The face of each panel is stepped back of the one immediately below, so as to give the roof a chance to tighten down on the pack in the lower panel before the coal is removed from the one just above, obviating to some extent the tendency of the roof to creep downhill and give trouble at the face.

The seam is mined and loosened by hand, all the mining being done in the coal, and on account of its fractured condition due to the folding, very little effort is required to bring it down. Props are set in rows parallel with the face, the rows being about 4 ft. apart. On account of the roof being full of slips, and very hard to keep up, long lengths of 2x4-in. yellow pine are used instead of the usual cap pieces, making a continuous cap the full length of the rows of props. Short lengths of the same material are put in at right angles, from one row to the other, marking the roof off into small squares,

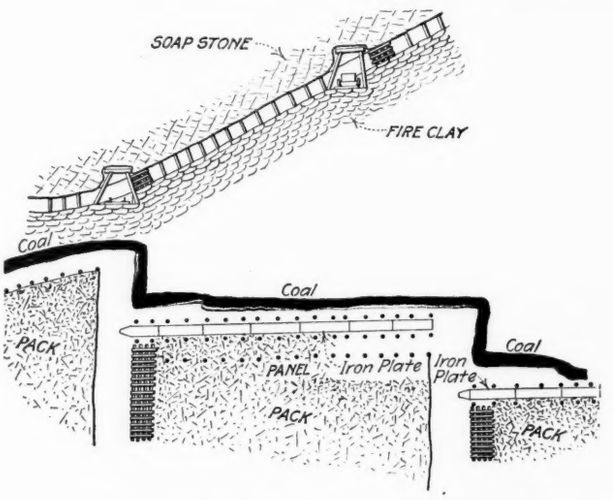


FIG. 2. PLAN AND SECTION OF PANELS

thus affording the miner a very good protection from the fall of small pieces of rock.

To facilitate the handling of coal along the face, sheets of No. 12 steel are laid between the two rows of props nearest the face. The upper sheet is held in place by chains wound around props at the upper heading, the lower sheets being hooked together. At the bottom of the last sheet is attached a small apron for regulating the flow of coal into the car. As soon as the face has advanced far enough for another row of props, the sheets are moved ahead.

As the mining is done in the coal, the material for the pack must all be obtained from the brushing of the headings and roadways above. As fast as it is needed, it is dumped down along the face and stowed away in place by the miner. One of the principal requisites in this panel scheme of mining, as in all longwall mining, is to keep the pack built up tight, as close to the face as possible, and still leave room for the miner to work. To hold the pack up in place, a heavy timber crib is built along the upper side of the headings as they advance. The pack material is handled along the roadways by means of a small steel side-dump car.

In order to get the coal cars to the face of the headings, slant roads are driven at such an angle to the dip as to give a sufficiently low gradient to allow a single mule to pull the empty car uphill, this angle of course varying with the pitch of the seam. In some instances, instead of driving a slant road to each heading, a permanent chuteway is maintained through the pack, the coal being slid down to the roadway below and the side-dump rock car being used to handle the coal from the face to the chuteway.

*Cameron, Mo.

The Labor Situation

General Labor Review

In the anthracite region there has been a rally by the union against the forces of disruption and contract breaking. The union leaders have been defended by the general grievance committee of the Delaware, Lackawanna & Western R.R., and the same committee has been trying to end the strikes at the Taylor and National collieries. Their action came too late to save their honor at the former mine, as 54 men had meantime been forced into the union by the strike which the grievance committee had not prevented. At the latter mine the committee was unsuccessful in obtaining peace, because of a number of misguided foreigners who could not be persuaded. The company is clearly in the right.

Two decisions have just been made by the Anthracite Conciliation Board. The Lehigh & Wilkes-Barre Coal Co. dispute shows no sign of settlement and a bench warrant has just been issued in the Luzerne County Court for the mine foreman who refused to place cars for the men who desired to ascend the slope in working hours.

Pennsylvania Mine Troubles Do Not Lessen

In the Pittsburgh region an interesting situation has developed, in which the companies and union are on one side and the mine workers on the other. The miners expect to have a meeting on July 1 at which they will rewrite the constitution, oust their leaders, elect new ones and write a new scale. Varying estimates are made as to the percentage of men idle. The union estimates are probably too high. The unfortunate feature of the strike is that it may make the men in that region and elsewhere disposed to break contracts to which they are more solemnly pledged than they are to the present one, and they may themselves, when they write a new contract, insert provisions which the McAlpin agreement expressly forbids.

Central Pennsylvania has not been perfectly serene. At the Soldier mine, near Reynoldsville, Jefferson County, there has been a strike of one day's duration against a mine foreman, the men asking for the reinstatement of some men he discharged. He was removed from office, and the strike ended June 7.

At the Dagus and Toby Valley mines of the Northwestern Mining and Exchange Co., in Elk County, there has been a strike about the deadwork provisions. The miners returned to work after several weeks of idleness, and at the last report expected to work till last Thursday, June 15. If by that time no settlement had been reached, they intended to strike.

Ohio's Troubles Seem To Be Entirely Ended

In Ohio the Crooksville conference has been held and a settlement has been made, the miners making several concessions. The Bergholtz district is trying to arrange a new scale. The troubles in Ohio are now about over. The important scales—in the Hocking Valley and the eastern Ohio district—are settled and the minor districts are following the example held out to them in these larger contracts. In the southwest the deadlock continues. District No. 14 still has many strikes, and until the mine workers go back to work under the old contract no new agreement will be signed.

In western Kentucky the subcommittee of the joint scale committee has agreed on a scale and conditions. The latter do not suit the whole committee, and the acceptance of the scale and conditions has been left to the international executive board with power to decide. It will be realized that western Kentucky and the southwest coal field are not subject to the McAlpin agreement, though of course they voted for it, and their agreements in the making are naturally vitally modified by it. About 4,000 men in western Kentucky are idle pending the board's decision.

Michigan Wrestles with the "Equivalent"

In Michigan, a state which alone disapproved of the McAlpin agreement, no new scale can be secured, and all the mines have been closed for an indefinite period. There are 1,500 men idle. The difficulty is over the change to a mine-run basis of payment. The change in rate which will equalize the change in method of weighing is the cause of the dispute. The operators are willing to follow the example of western Pennsylvania, Indiana and part of Iowa in paying for all coal mined, large and small, but the rate of compensation seems harder to adjust than the method of pay.

In Iowa the mine inspectors in the annual report are urging that there be "no more coal camps in Iowa." They advocate the housing of the men in neighboring towns because the life of coal-mine plants is so short in Iowa, barely 8 yr., that it does not pay to build good houses near the mines, and the men should not live in shacks without any modern conveniences.

Illinois Miners Can't Live on $5 to $8 a Day

The Russell Sage Foundation, in a report on industrial conditions in the central Illinois coal field, says that irregularity of employment is greater in that industry than in any other occupational group. The mine workers are employed about eight months of the year. The miners and loaders are paid from 57c. to $1.27 per ton for the coal that they mine. The rates vary according to the difficulties of mining.

Some workers are able to make as much as $5 a day, but the great majority make less. A few earn as much as $7 or $8 a day. But out of more than 300 possible working days in the year ending June 30, 1913, the mines of Sangamon County worked only 181 days. The average working days per month range from 10 in May and June to 20 in October.

The cause for the slackness in operation, according to the report, is found partly in the nature of the product and partly in the artificial conditions resulting from the biennial agreement negotiated between the operators and the miners' union. An over-supply of miners also aggravates the situation. "The net result," the report says, "is that while wage rates appear to be liberal, the miners' incomes are reduced until it is impossible in the case of many of the men to supply an average family of five or six persons with the reasonable necessities of life."

Anthracite Wage Disputes

Sometimes the fear arises that the mine worker does not know the value of keeping his word, and then something occurs to show that even if the sense of obligation is not fully grown, it is growing and will eventually reach full fruition. This was evidenced gratefully this week by the general grievance committee of the Delaware, Lackawanna & Western R.R. Coal Department, and it shows that grievance committees realize that they have other purposes than "grieving" over the faults of the operators.

This grievance committee is evidently examining itself, and it is clearly on the defensive as to the recent strike at the National colliery against the present conduct of machine contract mining. Its defensive attitude is a sign of conscientious scruples. Better yet is the fact that the general grievance committee resolves not to object to the 8-hr. agreement in any of its features and condemns those who do. That is a great acknowledgment of the paramount duty of every citizen to defend by right conduct the inviolability of his word.

On June 8 the general grievance committee of the Delaware, Lackawanna & Western R.R. Coal Department passed the following resolution:

Whereas, it has come to the notice of the general grievance committee of the Delaware, Lackawanna & Western collieries that false rumors have been circulated relative to the attitude of this committee toward the contract of May 5, 1916, and the interpretations thereof, as well as to the regularly constituted authority of the United Mine Workers of America and its officers, and

Whereas, these rumors have placed our committee in a false light and are doing irreparable injury to our cause, and are entirely unwarranted by an action heretofore taken by the committee, and

Whereas, the action taken by this committee at its last meeting in regard to the grievance relative to machine-contract mining at the National colliery, and the suspension of work at that colliery, was one of coöperation and moral assistance and contemplated no action in violation of any of the laws of our organization or terms of contract, and we regret that in this matter we seem to have been misunderstood and misconstrued, and in order that our attitude in matters affecting our organization might be fully understood by all, therefore be it

Resolved, that we, the general grievance committee of the Delaware, Lackawanna & Western R.R. collieries, in session this June 8, 1916, fully realize our obligation to our organiza-

tion and hereby affirm our loyalty thereto; that we stand for the conduct of our constitution and for the carrying out of our obligations under our contract in full accord with the provisions thereof. We are in full accord with the work and actions of the officers of our union in all its departments thereto, and be it further

Resolved, that we disapprove in the most emphatic manner of the conduct of persons alleged to be members of our union who advocate any secession movement in our ranks, fully realizing the great growth and power of our organization in recent years and the tremendous importance of it to the mine workers of the country at large, and especially in the anthracite region, and the dire results that might obtain if the work of destruction now being carried on by a few disgruntled members should be successful, and we hereby express our full confidence in the ability of our representatives to secure for us under the terms of contract, everything that should be ours.

With regard to the machine-mining contract, our case is now in the hands of the board of conciliation, and it is our intention to await in an orderly manner its determination, believing that only in that way can our interests be served.

DAVID LAWLER, President,
JOHN COYNE, Secretary.

Quit Their Work to Coerce 74 Nonunion Men

Yet, perhaps, the officials of the Delaware, Lackawanna & Western R.R. could not indorse what has been said about the excellent purposes of the men in its employ and about the general grievance committee in particular. For at the Taylor shaft the miners went on strike on Wednesday, June 7, because 74 men at that operation were not members of the union.

Tuesday was "card day," and as customary the union committee stood at the head of the shaft and examined the cards of all union men as they reported for work. They held up the men who were without the requisite pasteboards and the next day struck to bring pressure on those who did not want to join the union ranks. On June 12 the men, knowing that the strike violated the contract that had just been signed, voted to go back to work. All but 20 of the nonunion men had entered the union ranks by that time.

The difference at the National colliery came up for discussion at the same time, June 12, but here the foreign workmen prevented any decision being made to resume operation, though 15 members of the general grievance committee pointed out to them the error of their ways. It is said the English-speaking men desire to return to work. They argue that a strike cannot help matters, as the agreement forbids the board to consider any grievance while the complaining mine workers refuse to continue at work.

Miners Want to Abolish All Subcontractors

The question whether contractors are permitted under the agreement to hire men and deliver coal to the company operating the mine is the cause of the trouble. It was debated on June 6 before the board of conciliation, and some 30 members of the D., L. & W. grievance committee attended the session. A remark made by a member of the board about one of the grievance committee members caused them all to leave their places in the room, but John T. Dempsey eventually prevailed on them to remain.

President Dempsey argued the case for the mine workers, while W. L. Connell of the board and General Manager W. W. Inglis, of the Delaware, Lackawanna & Western R.R. Co. Coal Department, made the argument for the company.

The miners declare that the letting of machine-mining contracts makes the contractor a third party to the new agreement, which is supposed to be made between the coal companies and districts Nos. 1, 7 and 9 of the "anthracite mine workers' organization." This is the sheerest nonsense. The operators guarantee the miner's pay, and that pay must not be less than is provided in the contract with the operators.

The whole objection is to the increased amount of work a man must do when he is paid by the day and the necessary supervision is provided. The miners think, and perhaps truly, that after a while it will be necessary to look in every case to a sub-boss for work. This man will see that a full day's work is done for a full day's time. The industrious men do not object, but the less active ones are in favor either of a direct contract on the tonnage basis or of daywork without any supervision. There really is no case at all for the men under the recent contract. It is a wonder they have the effrontery to present the matter to the board.

Strikes Against Clause Requiring 8-Hr. Work

A strike of the drivers at the Primrose mine, Mahanoy City, has been settled by awarding an extra hour's pay. The strike had continued for some weeks.

The Lehigh & Wilkes-Barre Coal Co. is still having trouble at Lance No. 11, Nottingham, Buttonwood and Washington collieries. The nature of the trouble at the last three operations is explained in an editorial in this issue. The miners demand to be drawn out of the mine at any hour which pleases them. The law only provides that, under certain circumstances, cars in which to leave the mine shall be provided throughout the day just as a law might require in an office building that elevators be kept running continuously. But in both cases to use the conveyance at a forbidden time would be a due ground for dismissal. Especially would a manufacturing company be disposed to exercise its prerogative of discharge if the men were in the habit of going home at 2 p.m. or earlier.

A correspondent from the anthracite field writes as follows:

The labor situation in the anthracite region is quite serious at this writing. When "Coal Age" reaches the hands of its readers the anthracite field will probably be tied up by a strike of its entire force of men. The trouble is due mainly to the enforcement of the 8-hr. clause in the contract which has been signed by the company and the miners' leaders. In this a proviso was made that eight hours should constitute a day's work at the face of the breast or gangway where a miner works.

For the last fifty years the "contract miners" have had the privilege of going out of the mines when they had performed what they thought was a day's work. It will be noted that the agitation for the retention of the old way of working has not found voice among the miners of the Hazleton region. They are working in "flat work," and sometimes they use as many as four "buggies" to get their coal to the chute by which they send it down on the gangway to their platform to be loaded. They would work more than eight hours if they could, because they pay their laborers "by the car" and not by the day and it takes every hour they now get to fill the needed number of cars to make a shift. No word has come from them against the 8-hr. regulation.

But oh, the wail that has come up from the miners in pitching veins! Let us look at the way a miner proceeds to put in his shift at contract work. He leaves home at an early hour without much breakfast, and after his supplies are bought he gets down inside as fast as he can, because if he is late the "accommodation hoists are off" and he loses a day. Arrived in the gangway, his usual method is to eat a "piece," or in other words, a belated breakfast.

Then if he has his place up more than one heading (crosscut), he and his "butty" take up their props and plank for the day and get things in readiness to put "on a length." If everything is in good order, they will not have any loose stuff to take down and they can begin the day's work, put on their length of props and plank them and get their holes drilled and ready to fire.

Some miners will get their work done and will fire their shots by 1:30 or 2 p.m., and they will then come down to the first heading and eat the balance of the food they have in their pails. In many cases they will not need to return except to see that the manways and top are in shape for the fireboss to make his morning examination. After they have been in the mines for the length of time needful to perform the routine described, they want to go home, and home they will go despite any rules their leaders or anyone else has made for them.

When ten of them come to the bottom, they must be provided with a ride to the surface, and they are going out at their old hours and getting discharged for it in large numbers. Any mine official who has worked with miners or has been a miner at the face of a breast can see the problem that lies before the companies who are insisting upon the strict letter of the new agreement as applied to the contract miner.

It goes without saying that the miners who can produce a day's work up to, say, 2 p.m. are more desirable in the maintenance of the day's tonnage of the colliery than the fellow who requires the full 8 hr. to get out "his cut." The latter, in many instances, will be found unable to get out a fair tonnage. I have talked with old-time miners who were in the mines when I was unable to read, and they are a unit in declaring that the present situation is more threatening than any which has menaced the peace of this region for many years.

The strippers at the Red Ash colliery, who contended that they had to work 10 hr. and received only 7 per cent. increase, have been awarded their plea for an 8-hr. day and a 3-per cent. advance. The board of conciliation had no difficulty in arriving at this decision.

The miners of A. Pardee & Co. brought action before the board against that corporation, asserting that the price of supplies had been increased in apparent violation of the recently signed contract. The protest was settled out of court by S. D. Warriner and Thomas Kennedy, board members.

The Lehigh Coal and Navigation Co.'s miners presented a claim for a chute rate of $5.82 per day. This dispute was turned over to the umpire for settlement. The company holds that the work the aggrieved men are doing does not entitle them to the rate.

Strike in Pittsburgh Region

The Pittsburgh Coal Co. shows no signs of relenting. It regards the contract made with the mine workers' leaders as final, and if reports are to be believed, orders have been issued that the shoes be taken off the mules preparatory to a long spell of idleness.

The Lilly Coal and Coke Co. through its superintendent, Thomas Elliott, posted at its West Brownsville plant a notice ordering the men to return no later than Wednesday, June 14. The company declared in its notice that if they did not return the superintendent would secure men to work in their places.

The Pittsburgh Coal Co., which now has mines in Illinois, Ohio and West Virginia, is no longer dependent solely on the conditions in district No. 5 and can look on a strike in that

section with a degree of equanimity greater than they could formerly enjoy, when all their mines were in one district.

Union Declares Strike of Miners Is Illegal

The union is making an attempt to keep the men in obedience to the contract it has signed for them. On June 8 John P. White, the international president, Frank J. Hayes, the vice-president, and William Green, the secretary-treasurer, formulated their instructions to the mine workers of No. 5 district requiring that they return to work. The instructions run thus:

We regard stoppage of work by the miners of the Pittsburgh district as illegal, and we instruct them through you (the officers of district No. 5) to resume work immediately. In order to have their appeal legally presented to the international executive board it is absolutely necessary that they comply with these instructions by resuming work at once.

To this Van Bittner, president of the subdistrict, and Robert Wood, the secretary-treasurer, have appended a rider saying that they hope the men will comply with the instructions of the international officials immediately in order that the best interest of the organization may be preserved.

It is stated that only about 15 union mines in the Pittsburgh district are working, but Van Bittner on June 7 declared that

More than 50 per cent. of the miners in the district had resumed work and conditions will soon be normal. The mines at Smithton, Willock and Penobscot resumed yesterday, and those at Sturgeon and the Mansfield mine at Carnegie will resume tomorrow.

Some of the companies have made concessions to their men in order to keep them at work. At the Hazel Kirke mines of the Pittsburgh-Westmoreland Coal Co., an agreement has been reached whereby the men are to return to work without any increase in the price of mining supplies pending a decision of the questions in controversy. The Ellsworth Collieries Co.'s mines are working, but the men are somewhat restless.

Eight hundred union coal miners in district No. 10 met at Monongahela on June 12 to consider the advisability of breaking away from the United Mine Workers of America and forming a new union, Leroy Bruce, of Roscoe, being president and T. E. Phillips, of Monongahela, secretary. The miners asked the international board to reverse its decision and approve the strike, and in a resolution declared that they adhered to the McAlpin agreement for which they have voted, but not for the subsidiary agreement which District President Van Bittner and Vice-President Hanaway had signed for them. The meeting was adjourned till 10 a.m. Wednesday, June 14.

A special convention will be held in Pittsburgh July 1 to hear the report of the scale committee. At this meeting it is said the constitution will be revised, the recall of the district officials will be asked, their successors will be named, and a new scale will be formulated.

Bittner Issues Defense of New Wage Scale

President Van Bittner, hedging the main question whether the new scale does or does not comply with the McAlpin agreement, has issued the following statement, which is doubtless incontrovertible as far as it goes.

I am confident that when the miners really understand the new wage contract that was negotiated by the officers of the district organization they will readily realize that those who are advising them that they received a reduction in wages are seeking to destroy the United Mine Workers of America.

A great majority of the tonnage in the district is mined by machine, and we secured an advance of 5.39c. per ton on machine mining and 0.4c. per ton on dead work. This gives the miner an actual advance of 5.79c. per ton, or nearly 13 per cent. in the thin vein and nearly 15 per cent. in the thick vein. The advance in house rent, explosives, coal and lamps affects only 30 per cent. of the miners in the district.

The advance in house rent is ¼c. per ton; advance in powder, 0.6c. per ton; advance in coal, ⅛c. per ton; advance on electric lamps, ¼c. per ton, based on an average of 8 tons of machine-mined coal. These entire advances mean about 1.16c. per ton, or less than 3 per cent. The advance to the miner of 5.79c. per ton, less 1.16c. per ton still leaves him an advance of 4.55c. per ton, or more than 15 per cent. and on an average of 8 tons this gives him 36.4c. per day advance after all deductions have been made for the advances complained of.

Over 70 per cent. of our miners are using black powder, which is sold to them at 15c. per keg less than in Ohio, Indiana, Illinois and the other districts that make up the central competitive field.

The men working daywork in the mines received an advance of 13c. for unskilled and 14c. for skilled labor per day inside the mine. The house rent and coal affects only about 30 per cent. of these men. The advance in house rent and coal is only 2½c. per day, or about 50c. per month, which leaves the different classes of inside day labor which are affected by the house rent and coal, 10½c. and 11½c. per day, or nearly 5 per cent. of an advance over the old scale.

It has been stated that some of the large companies are disposed to a compromise with the miners. The labor press of Pittsburgh is in a most difficult quandary hardly knowing whether to side with the miners or with their leaders.

Rockmen's Wages in Southern Anthracite Field

The new scale for all rockmen in the collieries in Dauphin, Columbia, Schuylkill and Northumberland Counties of district No. 9, "Anthracite Mine Workers' Organization," was signed May 16, 1916, by James Matthews of the organization and W. J. Richards on behalf of the operators, both as members of the anthracite conciliation board. The old rates effective from Oct. 15, 1913, to Apr. 1, 1916, are quoted and the new rates to be in effect from Mar. 31, 1916, to Apr. 1, 1920.

The difference is in every case 5 per cent., but the new day is shorter than that formerly worked. Men who used to labor 10 and 9 hr. are now only to work 8 hr., and their pay per day and per week is raised 5 per cent. The scale is retroactive and dates from Apr. 1, 1916. The rates will be filed with the board of conciliation.

WAGES OF ROCKMEN, NINTH ANTHRACITE DISTRICT

Occupation	Old Rates Per Day	Old Rates Per Week	New Rates Per Day	New Rates Per Week
On Shaft Work				
Chargeman	$3.90	$23.40	$4.10	$24.57
Machine runner	3.12	18.72	3.28	19.66
Machine helper	2.60	15.60	2.75	16.38
Mucker	2.50	15.00	2.63	15.75
Blacksmiths	3.25	19.50	3.41	20.48
Blacksmith helper	2.35	14.10	2.47	14.81
Topman	2.00	12.00	2.10	12.60
On Tunnel Work				
Chargeman	3.85	23.10	4.04	24.26
Machine runner	3.02	18.12	3.17	19.03
Machine helper	2.50	15.00	2.63	15.75
Muckers	2.35	14.10	2.47	14.81
Mucker boss	3.00	18.00	3.15	18.90
Blacksmith on big machine	3.10	18.60	3.26	19.53
Blacksmith helper	2.20	13.20	2.31	13.86
On Small Machine and Shaft Work				
Chargeman	3.80	22.80	3.99	23.94
Small machine runner	3.10	18.60	3.26	19.53
Blacksmith	3.10	18.00	3.15	18.90
Blacksmith helper	2.10	12.60	2.21	13.23
Muckers	2.35	14.10	2.47	14.81
On Hammer Work				
Chargeman	3.10	18.60	3.26	19.53
Hammerman	2.80	16.80	2.94	17.64
Muckers	2.35	14.10	2.47	14.81
Blacksmith	2.80	16.80	2.94	17.64
Air-compressor engineer	2.00	12.00	2.10	12.60

These rates shall not apply to men who, because of superior skill and ability, were being paid higher rates in June, 1913, but it is distinctly understood that the employees retaining these higher rates must give superior service to the contractors.

The length of work day for all employees shall be 8 hr. of actual work at the usual working place, exclusive of noontime, with 5 per cent. added to the rates effective from Oct. 15, 1913. The new scale shall be effective from Apr. 1, 1916, to Mar. 31, 1920.

All rock contractors and their employees shall be placed under the awards and rulings of the conciliation board, and the rates and conditions herein agreed to shall be accepted by the board as being the rates of wages and the conditions effective Apr. 1, 1916.

Final Adjustments in Ohio

After the conferences between the operators and miners' representatives of the eastern Ohio district, which lasted for more than three weeks, the wage scale and working agreement, to run until Mar. 31, 1918, was adopted. The conferences were held at Canton, Cleveland and Wheeling, W. Va. It was a long-drawn-out fight, the principal point of dispute being the arbitration clause. The result was concessions by both factions, and the miners are apparently satisfied with the new arrangement. Operators are also pleased with the new scale, as in many ways it is as good as the old one.

Arbitration Board May Deadlock Disputes

The agreement provides for a permanent arbitration board to consist of three operators and three miners. This board will take up all grievances which can neither be settled by the committees from the various mines where they arise nor by the district officials. The operators to act on the board are C. E. Maurer, of the Glen Run Coal and Coke Co.; Michael Gallagher, of the M. A. Hanna Co., and S. H. Robbins, of the Youghiogheny & Ohio Coal Co. The miners' representatives are John Moore, president of the Ohio organization; C. J. Albasin, president of subdistrict No. 5, and William Roy, vice-president of the same district. The arrangement, it will be seen, seems to provide for a deadlocking of all disputes with strikes as a likely outcome.

Under the new agreement loaders are to receive 42c. and cutters 8c. per ton. "Snubbing" of coal is required in the new

agreement as in the previous scale. Safety requirements are more strict in several instances. Strikes can be called only by the state union officials, and if any strike is called illegally the men will be fined $1 per day each, each day they are idle.

Hocking Valley Low-Coal Miners Ask Increase

A meeting of delegates from 14 mines in the Hocking district, where the coal is thin, was held at Athens recently, for the purpose of formulating a low-coal scale. After talking over the situation, the representatives agreed to refer the matter to the district executive board. The Logan agreement provides a scale for mining coal of a thickness of 5 ft. or more, but there are at least 14 mines in the district where lower coal must be worked, and the men are seeking a differential above the regular price, this point not being covered in the Logan agreement. The operators take the view that no further agreement is necessary. And really, under the terms of the McAlpin contract who can say they are not right?

The joint conference of operators and miners in the Crooksville district of Ohio, which includes Muskingum County and a part of Guernsey County adjusted the wage scale and working conditions last week at Zanesville, Ohio. No trouble of any sort developed at the meeting, and several important concessions were granted by the mine workers. Chief among them was that of the width of rooms, which will be the same as provided in the Hocking Valley agreement, namely, 20 and 24 ft. In driving entries it is provided that no extra compensation will be allowed where the cutter employed is so narrow that three runs are necessary in place of two such as are needed with a wide cutter. Mines in the district are being gradually placed in operation.

The first meetings of the joint committee representing operators and miners in the Bergholz district were held last week at Bergholz. This district is a part of eastern Ohio, but owing to different mining conditions, it settles its mining rules separately. In all about 2,500 miners are affected. No serious trouble is anticipated in arriving at an agreement.

Western Kentucky Situation

It will be remembered that the miners and operators in the western Kentucky region nearly came to an agreement at the last session. The miners agreed to accept the old scale, but the operators desired some concessions relative to the working conditions. A meeting of the joint scale committee was held at Louisville, Thursday and Friday, June 8 and 9, after a delay of two weeks in which both sides had time to view the situation from all angles.

The subcommittee agreed to a wage scale, but when they reported to the committee as a whole, the concessions made by the representatives of the miners were unsatisfactory to their representatives in the whole committee. The operators were satisfied, but the mine workers were not.

International Executive Board Will Decide

The matter was left eventually to the international executive board, and it is hoped that a decision will be rendered about June 20. It appears that the mine workers in the subcommittee have surrendered four items in the working conditions, particularly the principal item as they view it—the right of each loader to two rooms from which to load. The operators have asked and the subcommittee has conceded, as far as it is within its power to concede, the right to appoint two loaders to every three rooms.

The position of the joint committee was set forth in the following statement, signed by J. A. Smith, secretary of the Western Kentucky Coal Operators' Association, and W. O. Smith, national organizer of the United Mine Workers:

Public Statement of the Scale Committee

The joint subscale committee of the miners and operators tentatively has agreed upon a wage scale for a period of two years from Apr. 1, 1916. This tentative agreement was accepted by the general committee of the operators, but was not acceptable to the general committee of the miners.

With a hope of ultimately reaching an agreement and thereby bringing about a resumption of work where 6,000 men are now idle, the question of whether or not the miners of district No. 23 shall accept the agreement tentatively agreed to by the subscale committee, was referred by the miners' general committee to the International Executive Board of the United Mine Workers' organization, which shall have full power to determine all matters in controversy and decide whether or not the tentative agreement can be accepted by the mine workers of western Kentucky.

It is to be hoped that the international board will be able to work out a solution of the problems that have been responsible for a deadlock between the operators and miners for more than two months.

Iowa Terms Near Settlement

After six weeks' negotiations, the mine workers and operators of the Iowa district have agreed on a wage scale and working conditions, and delegates from various locals in district No. 13, United Mine Workers of America, have approved the contract by a vote of 76 to 23.

Thus the danger of a miners' strike in Iowa, which appeared imminent during the last two weeks of the conference, is now almost entirely past. The new agreement, which will be effective until Mar. 31, 1918, will shortly be placed before the miners of the district for a referendum vote. Officials of the miners' union predict that the contract will be ratified by a big majority of the voters.

In the second and third subdistricts coal will be paid for only on a straight mine-run basis. The new rate for coal not mined by machine will be 77c. a ton in the second district, where a rate of from 72c. to 77c. formerly prevailed. The new rate in district No. 3 will be 79½c., as compared with the old rate of 76½c.

Machine-Coal Rate Still To Be Determined

No definite scale has been adopted for machine-mined coal in these two districts. The question has been left to a subcommittee of six. Three operator representatives will be appointed by Secretary E. C. Smith, and three miner representatives will be named by President William Rodgers.

In district No. 1, the coal mined will be paid for either upon the screen-coal or hand-picked basis. District No. 4 may pay its miners only for the screen coal in their product. However, where mine-run is loaded, the men will receive 10 per cent. less than screen-coal prices.

The bitter fight of the session hinged upon the scale in the "shooting" coal fields of the second and third districts, where coal is shot from the solid. For a time neither miners nor operators would make any concessions and a strike seemed inevitable. At this juncture a hurry-up call was dispatched to John P. White, international president, in the belief that he alone could prevent an open breach. Mr. White poured oil on the troubled waters and saved the day.

The preliminary organization of the scale committee, composed of 15 miners and 15 operators, was effected on Apr. 6. J. C. Lewis, of Boone, Iowa, board member from the fourth subdistrict, presided. Lawrence P. Love, of Des Moines, coal operators' association commissioner, was elected secretary. John Gay, of Albia, was chosen as Mr. Love's assistant.

Several Modifications in Old Agreement

The old agreement was taken under consideration and the miners presented their scale. In the second district they demanded 77½c. a ton for mine-run. The operators offered only 75c. After a bitter discussion this was increased to 76c., but the miners refused to make any departure from their original demand. Only the arrival of President White from the East prevented a break. The rate adopted was 77c. per ton.

Several important changes were made in the so-called "resolutions," which correspond to the rules in other fields. In resolution No. 13, defining engineers' duties and wages, the following scale was adopted: First-class engineers, $87.77 to $92.16; second-class, $81.10 to $85.15; third-class, $68.88 to $72.32.

For the first time the following holidays were specified in resolution No. 1, which designates the days and hours of labor: New Year's Day, Washington's Birthday, Apr. 1, Decoration Day, July 4, Labor Day, Thanksgiving Day, second Tuesday in December, 1916, and Christmas Day. Provision was also made in the resolution for the first time for a change of pay days whenever the regular pays would fall upon holidays.

A clause was inserted stipulating that daymen going down into the mine in the morning shall be given or paid for at least two hours' work. This does not apply when accidents occur whereby the men would have to be called out of the mine or a state mining law be violated. New provisions for checking off hospital dues were made in resolution No. 15.

Preparation Clauses Left Almost Unchanged

The importance of getting clean coal so that the product may be salable was recognized in resolution No. 3, providing a penalty for careless or reckless shooting. The resolution differs only in preamble and in other unimportant parts from the same resolution in the expiring contract. The preamble referred to is as follows:

Miners and operators realizing the importance of getting clean coal to insure the sale of same, it is mutually understood and agreed that miners and loaders will produce their coal in such a manner as not to increase the percentage of fine coal either by carelessness or reckless shooting and will load the coal free from impurities as nearly as possible.

Standard of Preparation of Anthracite Coal

At this time, when there are persistent rumors of a change in the standard of preparation by the anthracite mining companies, it is interesting to know on what basis the present system of sizes is founded. Some years ago the Philadelphia & Reading Coal and Iron Co., in buying coal from individual operators, incorporated a clause in their purchase contracts stipulating the size and preparation of coal, which has since come to be accepted as a standard by all companies. The following method of sizing is provided:

	Through a Mesh	Over a Mesh
Steamboat	8 -in. round	4½-in. round
Broken	4½-in. round	2¾-in. square
Egg	2¾-in. square	2 -in. square
Stove	2 -in. square	1⅜-in. square
Chestnut	1⅜-in. square	¾-in. square
Pea	¾-in. square	½-in. square
Buckwheat	½-in. square	⅜-in. round
Rice	⅜-in. round	¼-in. round
Barley	¼-in. round	3/32-in. round

For the new "boiler" size just adopted by some companies, there is as yet no known standard of preparation.

The percentages of foreign matter allowed in the different sizes is as follows:

Slate: Broken, 1; egg, 2; stove, 4; chestnut, 5 to 7; pea, 8; buckwheat, 10.

Bone: Broken, 2; egg, 2; stove, 3; chestnut, 5; pea, 10; buckwheat, 10.

The Reading circular also contains the following clause:

None of the above sizes shall contain an admixture of a larger size sufficiently to render the coal objectionable, nor respectively a larger proportion of any smaller sizes than is usually present in good merchantable coal; and it is specially agreed that neither egg, stove nor chestnut shall contain more than 5 per cent. of larger sizes; that chestnut shall not contain more than 10 per cent. of pea and 5 per cent. of buckwheat No. 1; nor pea coal more than 15 per cent. of buckwheat No. 1 and 5 per cent. rice; nor buckwheat No. 1 more than 15 per cent. rice.

Alaska Fields Open to Entry

Official announcement by Secretary Lane of the Interior Department was made June 2 that regulations have been issued under which private individuals and corporations may without further delay begin the leasing and operating of the extensive anthracite and bituminous coal fields of Alaska. Ten years have elapsed since the Alaskan coal fields were withdrawn from private entry and development. The regulations are accompanied by maps and important general information regarding the lands in question. Copies may be secured on application to the Commissioner of the General Land Office.

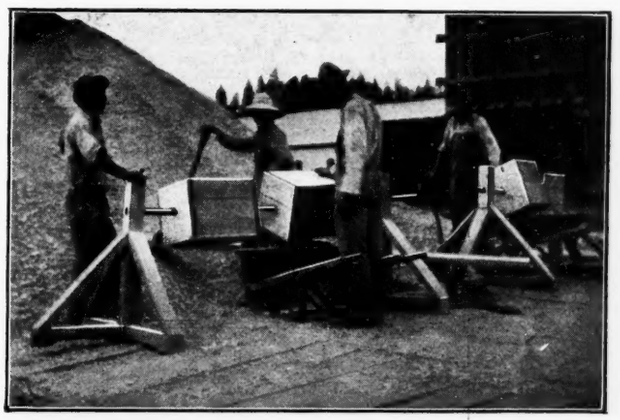
This announcement means that about 33,370 acres of coal-bearing lands in the Bering River country and about 13,920 acres in the Matanuska section are restored to entry. Small areas in each of the fields have been reserved as required by law, but all the rest of the coal lands are opened to private lease in amounts not exceeding 2,560 acres to any one person or corporation.

Leases will be granted for a period of 50 years. The Government exacts a royalty of 2c. a ton the first five years and 5c. a ton for the succeeding 20 years. After this period of 25 years, it is provided that the royalty shall not exceed 5% of the selling price of the coal. The royalty exacted is considered small but reasonable in view of all the conditions, and was made low for the purpose of encouraging the leasing of the coal lands and to aid also in the development of local markets for the product.

The Government's plan is to receive proposals for leases without delay. Preference will be given to those who will make the largest investments and the earliest development of the coal fields for commercial purposes. The form of lease is similar in large part to the private leases obtaining in the West Virginia coal fields and has been passed upon and approved by a board of coal operators.

Measuring Concrete Aggregate in Revolving Boxes*

The revolving measuring boxes shown in the accompanying illustration were successfully used by a mining company in the construction of a reinforced concrete bin. The yardage did not warrant the construction of sand and stone bins, and the mixing yard consisted of the usual loading platform adjacent to the cement shed. The revolving boxes were used in measuring both the sand and the stone, which had to be wheeled up runways to this platform. The cement was measured and discharged directly into the mixer.



MEASURING CONCRETE MIX IN DUMPING BOXES

The boxes are proportioned in size to hold the exact quantity of each material and are placed on 1¼-in. pipe as axles, with two or more boxes to the stand as desired. The pipe is carried through holes in the 4x4-in. posts, which are braced and carried on a 4x4-in. supports.

A dry batch of 10½ cu.ft. of 1:2:4 mixture was used and required three 2-cu.ft stone boxes, two 1½-cu.ft. sand boxes and one 1½-cu.ft. cement box. The framework was light and could easily be moved into the stone or sand piles or from one job to another. The whole framework is detachable and can be taken down in a few minutes.

The bottoms of the boxes were set high enough to allow a wheelbarrow to pass beneath them. Thus the box could be turned on the pipe, discharging the load and righting itself for loading. The apparent objection to this form of loading is in the height of shoveling the material, but by using scoops the boxes were quickly loaded and the additional height was not objectionable. Loading delays were eliminated, and a uniform mixture obtained so that all voids between the stone were completely filled.

*H. B. Andrews in "Engineering News," May 25, 1916.

Coke Production Increases

The coke made in the United States in 1915 amounted to 41,581,150 short tons, an increase, as compared with 1914, of 7,025,236 tons, or 20 per cent., and was within 5,000,000 tons of the record output of 1913, according to figures compiled by C. E. Lesher of the United States Geological Survey. Of this total, 34 per cent., or 14,072,895 tons, was byproduct coke, and 66 per cent., or 27,508,255 tons, was made in beehive ovens. The increase in the output of byproduct coke in 1915 as compared with 1914 was 25 per cent., and in beehive, 18 per cent. An encouraging feature of the year's record was that the quantity of byproduct coke made in 1915 was the greatest yet recorded, exceeding the output of 1913 by 1,358,195 tons. Plants were started at Cambria, Penn., Duluth, Minn., St. Louis, Mo. and Chattanooga, Tenn.

The production, by states, in short tons, is summarized in the following table:

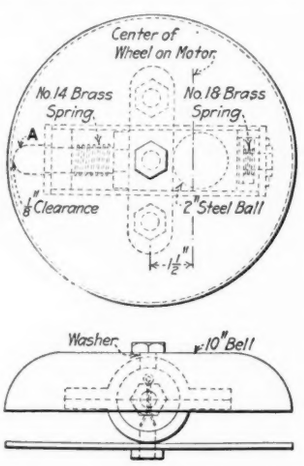
State	Beehive	Byproduct	Total
Alabama	1,001,477	2,070,334	3,071,811
Colorado	670,938	.....	670,938
Georgia	20,039	.....	20,039
Illinois	.....	1,686,998	1,686,998
Indiana	.....	2,768,099	2,768,099
Kentucky	284,516	241,581	526,097
Maryland	.....	313,283	313,283
Minnesota	.....	127,847	127,847
New Mexico	389,411	.....	389,411
New York	.....	684,461	684,461
Ohio	19,101	665,557	684,658
Pennsylvania	22,530,567	3,092,295	25,622,862
Tennessee	233,705	23,268	256,973
Virginia	629,807	.....	629,807
West Virginia	1,250,235	141,211	1,391,446
Massachusetts, Michigan, Missouri, New Jersey, Utah, Washington*, Wisconsin	478,459	2,257,961	2,736,420
Total	27,508,255	14,072,895	41,581,150

*Combined byproduct and beehive coke output of Washington, 136,552 tons.

Automatic Locomotive Gong

By A. Cohn*

The motor bell shown in the illustration has proved to be satisfactory in the mines of the Republic Iron and Steel Co., at Gilbert, Minn. It is simple and does not depend on any outside power for its operation. This bell is attached to the wheel of an underground electric locomotive. The revolution of the wheel causes the bell to ring. When the cylinder points downward, the steel ball falls on the plunger *A* and causes it to strike the gong. As the bell turns upward, the ball recoils on its spring, and is ready for the next turn. The rate of travel can be easily determined by the sound of the bell as its frequency and tone depend directly on the speed of the motor. In this way it acts as a safety device. It is the intention of the Republic Iron and Steel Co. to install automatic bells of this type on all the locomotives which it uses underground.—*Engineering and Mining Journal.*

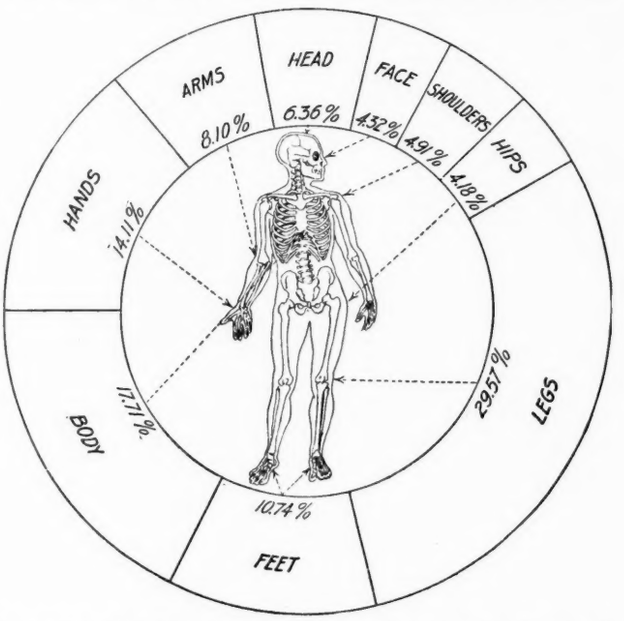


AUTOMATIC LOCOMOTIVE GONG

*Box 267, Gilbert, Minn.

Nonfatal Accident Chart

A body chart, or diagram, showing the percentage of nonfatal accidents to different parts of the body, arranged from a tabulation of 6,719 nonfatal injuries from accidents at coal mines, has been prepared by the Bureau of Mines and is contained in a pamphlet entitled "Coal Mine Fatalities in the United States, 1915," compiled by Albert H. Fay. It will be seen from the illustration that practically 30% of the accidents at coal mines result in injuries to the legs, and that injuries to the hands amount to 14%, and other parts of the body as shown. This diagram was prepared to aid surgeons and hospitals in selecting the necessary supplies for use at coal-mine hospitals.



PERCENTAGE OF NONFATAL INJURIES RECEIVED BY THE BODY IN MINING ACCIDENTS

Heat Value of Fuels*

Kind of Fuel	Heat Units per Lb.	Relative Values	Lb. of Water Evaporated per Lb.
Carbon, pure	14,500	1.000	15.00
Hydrogen	62,500	4.280	62.75
Marsh gas	26,415	1.816	26.68
Olefiant gas	21,328	1.466	21.54
Coal, anthracite	14,833	1.020	14.98
Coal, bituminous	14,796	1.017	14.95
Lignite, dry	10,150	0.7	10.35
Peat, kiln dried	10,150	0.7	10.25
Peat, air dried	7,650	0.526	7.73
Wood, kiln dried	8,029	0.551	8.10
Wood, air dried	6,385	0.439	6.45
Charcoal	13,500	0.93	14.00
Coke	13,620	0.94	14.00
Petroleum, W. Va.	18,300	1.255	18.80
Petroleum, Penn.	18,050	1.24	18.60
Petroleum, Ohio	18,450	1.27	19.05
Petroleum, Asia	18,000	1.24	18.60
Petroleum, Europe	18,000	1.24	18.60
Animal fat	9,000	0.65	9.30

Convention of Pennsylvania Coal Merchants' Association—The 12th annual convention of the Pennsylvania Retail Coal Merchants' Association will be held at Harrisburg, Penn., on June 20, 21 and 22. The first two days will be devoted to the transaction of business important to every retail coal merchant and to the inspection of a complete line of coal-handling machinery, auto trucks and general supplies. On the third day the Philadelphia & Reading Coal and Iron Co. will entertain the members of the association on a trip to and inspection of Brookside Colliery, in the Lykens Valley district.

*"Power," June 6, 1916.

Legal Department

Recent Judicial Decisions

By A. L. H. Street*

Principal's Rights Concerning Agent's Books—Books kept by the representative of a coal company as such belong to the company and may not be withheld by him as being his own property. (West Virginia Supreme Court of Appeals, Flanagan vs. Flanagan Coal Co., 88 Southeastern Reporter, 400.)

Responsibility for Negligence of Certified Miner—A Pennsylvania operator is liable for injury to a coal miner due to negligence of the latter's immediate boss, a certified miner, as distinguished from a certified foreman. (New York Supreme Court, Appellate Division; Andriuszis vs. Philadelphia & Reading Coal and Iron Co., 156 New York Supplement, 260.)

Surface Owner's Right of Access Through Coal—When the owner of land has title to the soil below coal which has been conveyed to another, he is entitled to access through the coal for the purpose of sinking and maintaining an artesian well. (Pennsylvania Supreme Court, Pennsylvania Central Brewing Co. vs. Lehigh Valley Coal Co., 95 Atlantic Reporter, 471.)

Ratification of Corporate Officer's Unauthorized Act—The unauthorized act of a coal company's officer in borrowing money to conduct the corporate affairs binds the company upon ratification expressed by a majority of the directors at a meeting duly called. (West Virginia Supreme Court of Appeals, Flanagan vs. Flanagan Coal Co., 88 Southeastern Reporter, 402.)

Contributory Negligence in Cogwheel Accident—An operator's failure to safeguard moving cogwheels in coal-washery machinery does not render him liable for injury to an employee, resulting from the employee carelessly permitting a loosely dangling sleeve to become caught in the wheels. (Pennsylvania Supreme Court, Di Magnio vs. Jefferson & Clearfield Coal and Iron Co., 96 Atlantic Reporter, 746.)

Tennessee Mine Foreman Law—The law enacted by the Tennessee Legislature in 1907, purporting to make coal operators liable for negligent performance of the statutory duties of certified mine foremen, resulting in injury to miners, was not validly adopted, and hence an operator is not liable in such cases. (Tennessee Supreme Court, Tennessee Coal, Iron and Railroad Co. vs. Hooper, 175 Southwestern Reporter, 1146.)

Liability for Fall of Rock—An Illinois coal operator will not be permitted to escape liability for injury to a miner caused by fall of rock attributable to willful failure on the part of the operator to deliver demanded props, on the ground that the miner was guilty of contributory negligence in knowingly remaining at work in a place of danger. (Illinois Supreme Court, Arkley vs. Niblack, 112 Northwestern Reporter, 67.)

Validity of Agreement for Continued Freight Rate—A railroad company's contract with a manufacturer to carry coal to his plant from points in the same state at certain rates for a period of 30 years was valid and enforceable, although the company after making the contract raised its tariffs on such shipments. (Pennsylvania Supreme Court, Pittsburgh & Lake Erie Railroad Co. vs. Colonial Steel Co., 96 Atlantic Reporter, 1037.)

Contract for Construction of Slopes—Under a contract for construction of two slopes in a mine, a clause making the contractor liable for $40 for every day's delay in completing the work beyond a certain time fixed as the time for completion does not make him liable so far as delay is attributable to the doing of extra work required by the owner. (Pennsylvania Supreme Court, Foye vs. Lilley Coal and Coke Co., 96 Atlantic Reporter, 987.)

Dangerous Conditions Existing in Abandoned Places—An operator on abandoning parts of mines on exhaustion of coal is bound to warn employees against going into such places when the circumstances are such that the employees do not know of the abandonment and are apt to be led into such places in the performance of their duties, and when dangerous conditions exist in those places. (West Virginia Supreme Court of Appeals, Osborn vs. Darby Coal Mining Co., 86 Southeastern Reporter, 834.)

Duty to Warn Inexperienced Employee Against Danger—The legal principle that an employer is liable for injury suffered by an employee set at work in which he was inexperienced, without warning of dangers peculiar to the occupation, applies to a case where a labor boss at a mine directed a coal loader, who was not a qualified blaster, to fire a blast to loosen coal jammed in chutes. (United States Circuit Court of Appeals, Second Circuit; Lehigh Valley Coal Co. vs. Lukaszunas; 230 Federal Reporter, 792.)

Employee's Violation of Rule as Contributory Negligence—Existence of a rule adopted by a coal operator for the safety of his employees and its violation by an injured miner does not defeat liability of the operator for an accident attributable to negligence toward the injured man, when it appears that the operator had so far acquiesced in continued violations of the rule that it might be inferred that the rule had been abrogated. (Kentucky Court of Appeals, Meek vs. Fluhart Collieries Co., 183 Southwestern Reporter, 469.)

Negligent Employment of Minors—Employment of a boy under 14 years old in a coal mine, in violation of the West Virginia laws, renders the employer liable for injury sustained by the boy as a natural and direct consequence of the employment, but contributory negligence on the part of the minor is a good defense to lability when it appears that he fully appreciated the dangers incident to the careless act attributed to him. (West Virginia Supreme Court of Appeals, Griffith vs. American Coal Co., 88 Southeastern Reporter, 595.)

Operator's Duty Concerning Machinery—An operator in furnishing a coal-cutting machine or other machinery or tools for the use of employees is bound to use due care to see that the appliances are reasonably safe for the purpose, and an employee may assume that this duty has been performed, in the absence of information to the contrary. But the operator is not liable for injury resulting from improper and unauthorized use of a machine by the employee injured. (West Virginia Supreme Court of Appeals, Robinson vs. Virginia-Pocahontas Coal Co., 88 Southeastern Reporter, 620.)

Foreman or Superintendent as Employer's Representative—Since a foreman or superintendent directing men stands in the place of the employer, the latter cannot excuse himself from liability for injury to a workman resulting from negligent failure to warn him against dangers of his work, which, through inexperience, he may not have known, by showing that the foreman or superintendent was instructed not to assign inexperienced men to the task in performing which the particular accident occurred. (Wisconsin Supreme Court, Bugajski vs. Milwaukee Western Fuel Co., 157 Northwestern Reporter, 521.)

Mine Drivers as Fellow Servants—Excessiveness of Personal Injury Verdict—Coal-mine mule drivers working in different entries were not fellow servants, within the rule which exempts an employer from liability for injury to an employee resulting from negligence of a fellow servant. Three thousand dollars is not excessive recovery for injury to an employee whose hand was crushed between a car and an entry wall, if the accident practically incapacitated him for physical work, he having previously earned $2.24 a day. (Kentucky Court of Appeals, Robinson vs. McHenry Coal Co., 183 Southwestern Reporter, 489.)

Mine Lessor's Responsibility.—Sufficiency of Safety Precautions—A coal company which has leased a mine to another who is in charge of active operations is not an "operator" within the meaning of the Indiana laws, which impose certain duties on operators of coal mines to secure the safety of miners, unless it appears that the lease is a mere subterfuge intended to defeat the first-mentioned company's liability under such laws. An operator is chargeable with notice of all defective conditions in mine roofs which would be discovered upon making a reasonably diligent inspection, the duty of inspection not being discharged by mere visual examination in every case. (Indiana Appellate Court, Deep Vein Coal Co. vs. Raney, 112 Northeastern Reporter, 392.)

*Attorney-at-law, Minneapolis, Minn.

Editorials

Co-operation Among Illinois Coal Operators

Association movements, which have been so successful in other parts of the state, are spreading to the Fifth and Ninth districts of Illinois. This has always been considered the most difficult region in the country to handle, because there are four separate and distinct classes of operators who have nothing whatever in common:

First are the railroad operators; second, the operators who own their own branch railroads bringing their coal direct to the market; third, the coöperative mines, which are able to cut down on the cost of production by simply reducing wages; and fourth, the straight commercial union mines, which have none of these advantages. The railroad mines are not much interested in market prices as they sell only their surplus coal. The coöperative mines all want work because the men insist on drawing their pay regularly, and consequently they will run full time irrespective of what price the coal may bring. The mines which operate their own railroads direct to the market insist on running so their roads will show earnings.

The straight commercial operators, who have none of these advantages, consequently remain to hold the bag. There is a large group of each class of operators, and as they have very little in common and are all suspicious of one another, it was always considered that any co-operation among them was impossible. With this condition in mind, even the fact that they have made a small and successful beginning is a most gratifying augury for the future of the industry in the state.

Hampton Roads Exports Heavy

The abnormal situation as regards ocean freights has discouraged prospective exporters to such an extent that the impression is spreading that there is little activity in this line; none the less, there is a heavy movement, as is evidenced by the tonnage reports from Hampton Roads. For instance, during the week ended June 10 the total dumpings amounted to 386,998 tons, making the third highest record in the history of the port. The record week for the Hampton Roads piers was made on Aug. 28, 1915, when 397,302 tons was handled, and the second high record was made the week immediately succeeding, with 387,182 tons.

Only once since Mar. 11 of this year has the tonnage fallen below the 300,000-ton mark, only 295,322 tons being dumped during the week ended Apr. 22. This is in striking contrast with the performance over the closing three months of 1915, when the 300,000-ton mark was reached only once. During this time shipments for the week fell as low as 207,292 tons in one instance. This evidence of the ability of the market to cope with the extraordinary high ocean freights will be gratifying to prospective exporters.

Nonrepresentative Government in Alaska

It is interesting to see the United States engaged in nonrepresentative government in Alaska. It works from Washington, D. C., almost as well as similar government used to work from Whitehall. But "work" is not the correct term; "stops work" would be better, for it is easier to stop development than to promote it.

After accepting payments on land the Government for several years refused to say whether it would permit entry or not, and on what conditions and at what rates. It just lay down on the job. Then it practically froze out one of the railroads and finally bought it in at a knockdown price. Sequent on this it started to build further railroad lines, and at once there was a strike because the day wages of laborers on the job were less than those ruling in that vicinity. Now the people are clamoring that the railroad being built does not develop the best coal and most accessible field.

It is always the way when strangers try to muddle into the management of a country they do not know. Successful colonies have always been largely self-governing and self-handling. We taught Great Britain such an admirable lesson in governing, it is a wonder that we cannot absorb a little of it ourselves.

Was it really our clearer vision which enabled us to take a correct view of the rights of man in 1776 or was it merely a blind fortune that made us take the side we did, being as we then were the under dog in the struggle? Were they really the rights of man for whom we were embattled or were we fighting for our own rights alone? But as Alaska is a small, sparsely populated country, inhabited by few but unusually intelligent people, it is not merely representative government that it wants but a large degree of home rule for its private affairs. Surely the control of land should be vested in the state or territory of which it forms a part.

A representative government even when secured does not give any assurance of equitable rule when one section of the country is so different from the rest that the other parts cannot understand it and so much smaller than the rest that its vote is a mere drop in the bucket.

Uncle Sam appears to our loyal citizens of the West and of Alaska as a very benevolent old gentleman without the needed comprehension of the necessities of youth. He has in fact no clearly defined mind about anything in that territory, and that is not strange, for he must know the facts to come to some conclusion about them, and so far that knowledge has not come to him and he is too little interested to travel north to ascertain them.

The evils of absentee government are worse than those of capitalism. Alaska is a frightful example of socialism, the more telling because it is not dishonest but merely misguided men who have brought her to such an evil pass. It is pleasing to see, however, that at last leasing of coal is permitted in the Alaska coal fields.

New Ways to Break a Contract

In the anthracite region the contract miners are still trying to violate the agreement which was signed by the miners' representatives at Pottsville. They are determined that they will not work an 8-hr. day, and they are endeavoring to use the law to compel the companies to aid them in breaking their contract. It remains to be seen whether the courts will be compelled by a slovenly enactment to aid in this work.

At the Nottingham No. 15 colliery of the Lehigh & Wilkes-Barre Coal Co., located at Plymouth, Luzerne County, Penn., the inside workmen had to enter and leave the mine by a roadway, No. 1 slope, which they alleged was too dirty and dusty for travel. Appeal was made to Mine Inspector D. T. Davis, and he notified the officials to furnish a car in conformity with the mine law. This was done, and the men were hoisted out of the slope whenever it was their good pleasure to leave their appointed work.

But when the Pottsville convention agreed that every man would work 8 hr., the Lehigh & Wilkes-Barre Coal Co. naturally inferred that if the car were ready to hoist the men when the 8-hr. stint was accomplished, the law would be satisfactorily complied with.

But the miners soon showed that they regarded the agreement as inapplicable to their case. They felt entitled to quit whenever they desired and therefore also justified in demanding a car to hoist them to the surface whenever they were ready to quit. The world was particularly cruel to these men. The reader should mark their grievous case because it was peculiar.

Many, if not most, of the miners in the anthracite region can leave the bulk of the hard work to their laborers. But these poor fellows, we are told, found that laborers were few and they had to do their own work and, like fine ladies who cannot afford to hire a maid, they were completely fagged out and they ordered their carriage early for that reason. Now the Lehigh & Wilkes-Barre Coal Co., being a negligent coachman, did not comply with this demand, which indeed argues a hardness of soul or a soulless corporation.

Apparently, even when the miners had to do the degrading work of loading cars, they got through early just as ever and they went out to the foot of the slope and whistled for the coachman. But the car did not come till the quitting hour until the men, after many days of waiting, threatened to bring legal pressure on the company if it would not comply with the law as the miners construed it and give them cars at all hours.

Now the law is incontestable wherever persons are regularly hoisted and the average pitch is over 15 deg. and the distance over 1,000 ft.

Rule 57, on which the miners rely, runs thus:

> **Any superintendent or mine foreman who prevents the footman from giving an empty car or cage to the number of men designated in a former rule, shall, upon information by any person engaged in the mines given the mine inspector, be fined the sum of $50 for each offense.**

In consequence, probably, of a lengthy consideration of this enactment, one day a car was furnished at the foot of the slope at an early hour. The cruel foreman was there, and as the men entered, he told them they were discharged. They returned to the mine the next day and demanded reinstatement, and when it was refused, all the other miners went on strike in sympathy, marching in a body to their meeting hall, and finally a committee appeared before a justice of the peace and made affidavit that the company had violated the law.

The state mine inspector has promised to do all he can to enforce the rule, and he has been furnished with affidavits setting forth its alleged violation. The miners are going to do their full part and propose to prevent the Lehigh & Wilkes-Barre Coal Co. by discharging the men from enforcing the terms of their signed contract. The miners will have a car provided when and where they will; they will quit when they so desire regardless of contracts. They propose to call out all the miners working for the Lehigh & Wilkes-Barre Coal Co. They are discussing dividing the Scranton district, No. 1, so that the district officers will have time to perform all the many onerous duties involved in the breach of the contracts they have signed.

There is going to be trouble and to spare if any of the corporations try to enforce a contract on which the signatures of the mine leaders are as yet hardly dry.

Beclouding the Real Issue

The question at issue in the strike in the Pittsburgh region is very simple. The miners have only befogged it by trying to show that the 1916 contract is less liberal than that made in 1914. By that means they have only furnished the operators and the union with a chance to evade the main issue. There is no doubt that the contract recently made for the miners is a better one than that made, for instance, in Illinois or Ohio; but why discuss that question?

The point to be considered is whether the new contract complies with the provisions of the McAlpin agreement. No one but the miners seems willing to answer that question without evasion. The operators appear to say that they have signed an agreement which embodies all the understandings they had with the miners' leaders at the time the McAlpin agreement was being written.

Now these understandings are matters of dispute. In any event, whether they were in conflict with the McAlpin contract or not makes no difference. The important matter is, to what did the operators sign their names when the McAlpin agreement was accepted? And also, to what did the miners agree when they voted for that document? They did not vote for understandings; they voted for an instrument.

No successful man signs an agreement which he knows omits several vital matters and trusts to verbal promises to make up the deficiencies in the document which he receives. If he does, the law courts will not sustain him. You may give evidence to explain a contract; you cannot present evidence to change its very terms.

Moreover, the operators know that for the mine leaders to sign a contract in conflict with the McAlpin agreement is to act beyond their powers. Such signatures are binding only against the signers, the mine leaders, not against their principals, the miners. Perhaps the operators and the union leaders have an argument to meet this contention. If so, why do they not present it? So far all they have done is to declare the miners lose but little in the secondary contract, though the underlying instrument promises that they shall not lose at all.

Department of Human Interest

First-Aid Meet in Oklahoma

By R. M. Johns*

SYNOPSIS—A first-aid meet where each team was examined and watched by two physicians. A test is made of the judgment of firebosses in the presence of gas. Lives saved by first-aid men.

The Third Annual Oklahoma First-Aid Contest was held at McAlester, Okla., on May 27, 1916, under the auspices of the Oklahoma miners, the operators' associations and the United States Bureau of Mines. The McAlester contest was arranged to follow the general lines of that held at Pittsburg, Kan., on Community Day, May 17.

There were athletic games, such as racing and a tug of war. A prize was awarded to the oldest active working miner. Music was furnished by a band composed of working miners. A baseball game with miners as participants supplied a further diversion, while a demonstration of the explosibility of coal dust in the presence of black-powder flame brought vividly before the assembled miners and their wives the dangers of mining where due precautions are not taken.

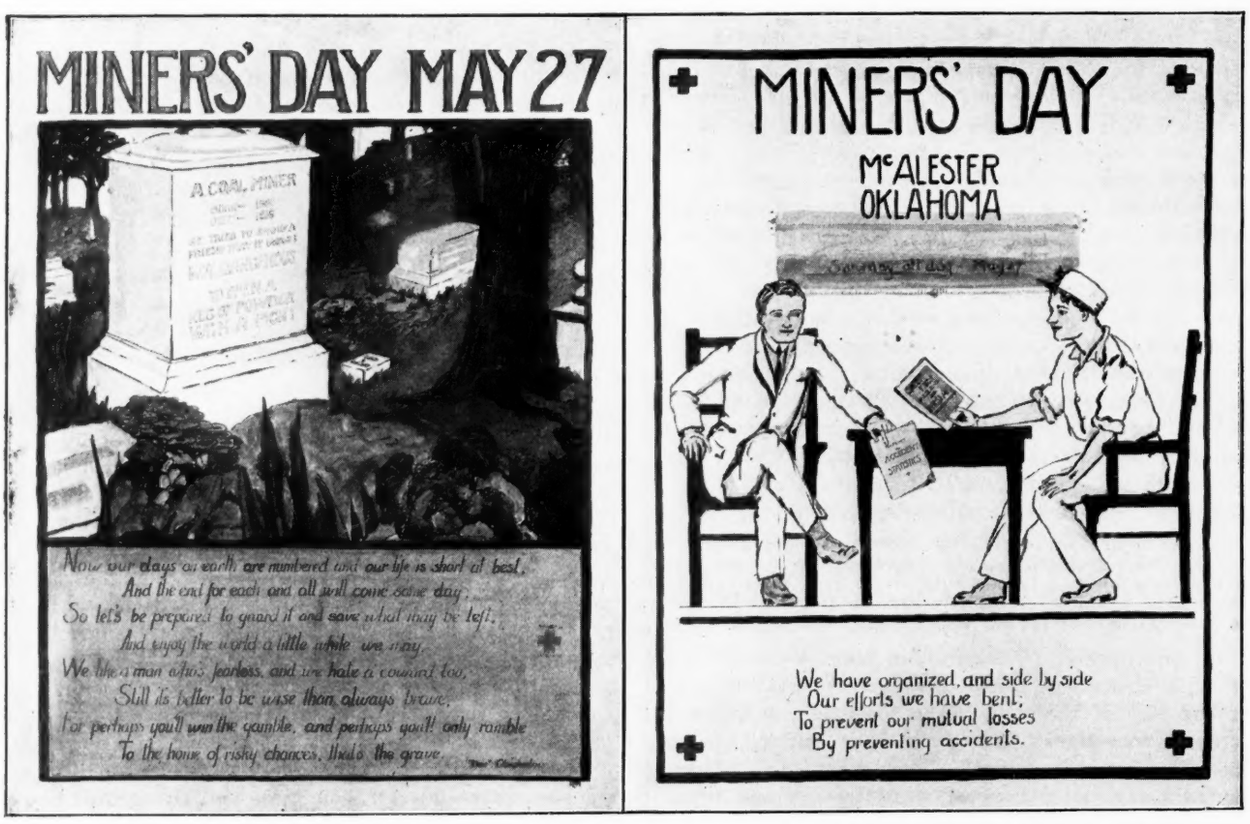
*1008 South 5th St., McAlester, Okla.

An innovation in first-aid judging was the employment of two physicians to judge each team, the chief judge having supervision of them all. So far as is known, this is the first time such a plan has been followed. The winning team was that of Lehigh, Okla., which thus acquires the state cup a second time. This is the team that won the contest at Kansas City last summer and was sent in consequence to the Panama-Pacific Exposition at San Francisco.

The names of the teams, captains and their scores are as follows: (1) Lehigh, Alex Ogilvie, captain, 97.67; (2) Wilburton, Tony Moye, captain, 97.5; (3) Alderson No. 1, Thomas Malloy, captain, 95.83; (4) Krebs, L. F. Thompson, captain, 95.17; (5) Brewer, R. W. Wright, captain, 89.67; (6) Alderson No. 2, Frank Santino, captain, 89.5; (7) Gowen, Frank Main, captain, 86.67. Prizes were given to each of these teams.

One of the gratifying results of the contest was that there were no ties. The points made by each team were added together and divided by the number of events, the resulting figures being the record of the team in the contest.

W. D. Ryan, mine safety commissioner, Bureau of Mines, acted as announcer, and W. W. Fleming, foreman miner in charge of the McAlester Rescue Station, and Thomas L. Rachels, first-aid miner, Mine Rescue Car 4,


MINERS' DAY MAY 27
A COAL MINER
Now our days on earth are numbered and our life is short at best,
And the end for each and all will come some day;
So let's be prepared to guard it and save what may be left,
And enjoy the world a little while we may.
We like a man who's fearless, and we hate a coward too,
Still it's better to be wise than always brave;
For perhaps you'll win the gamble, and perhaps you'll only ramble
To the home of risky chances, Hades the grave.
MINERS' DAY
McALESTER
OKLAHOMA
We have organized, and side by side
Our efforts we have bent;
To prevent our mutual losses
By preventing accidents.

POSTERS WHICH ADVERTISED MINERS' DAY AND THE ANNUAL OKLAHOMA FIRST-AID CONTEST

MINERS' DAY
HE DID NOT BELIEVE IN FIRST AID
DO YOU ?
COAL OPERATORS-U.M.W.A.-U.S. BUREAU of MINES FIRST AID
CONTEST ✕ MAY 27
CUT IN HALF!
WHEN THE ACCIDENT OCCURS
FIRST NATIONAL BANK
Pay to the order of
$
Dollars
for
UMWA
OKLAHOMA COAL OPERATORS ASSOCIATION AND U.S. BUREAU OF MINES
THE OKLAHOMA COMPENSATION LAW PROVIDES
THAT YOU SHALL RECEIVE 50% OF YOUR AVERAGE WEEKLY WAGE DURING THE TIME YOU ARE INCAPACITATED FROM WORK !
A WOUND TREATED WITH
FIRST AID
SHORTENS THE TIME YOU ARE ON HALF PAY !
FIRST AID CONTEST IN M'ALESTER, OKLAHOMA, ON
MINERS' DAY • MAY 27

THESE HAND-DRAWN POSTERS EMPHASIZED THE VALUE OF FIRST-AID TO THE MINE WORKER

assisted in training and arranging the teams, in constructing the demonstration gallery and in conducting the explosions exhibit.

In the coal-dust demonstration a shot charged with permissible explosive was fired into a mass of dry coal dust placed on a platform in front of the gallery. No flame was visible, and the dust was not ignited. Two subsequent shots were fired which had been charged with black powder, and explosions resulted in both cases.

Gas Testing Contest with Safety Lamps

The mine-rescue station at McAlester has recently been supplied with a lamp-testing gallery, the first to be sent out to the stations of the bureau. This gallery is connected with a supply of natural gas, and by an arrangement of electric motors and gas meters any degree of mixture of gas and air can be obtained. Safety lamps of various kinds are placed in the gallery, and different percentages of gas admitted.

Much interest has been aroused among the firebosses, superintendents and foremen throughout the field through the introduction of this apparatus, and numerous tests and demonstrations have been given, the firebosses and superintendents bringing their own safety lamps and comparing while in the gaseous mixture the behavior of their lamps with that of those used at the station. In the evening a contest was held in the testing of the percentages of gas in the mixture in the gallery by observing the flame of the lighted safety lamps. Only firebosses in active service were eligible to enter this contest.

Frank Mastako, fireboss in No. 5 Alderson mine of the Rock Island Coal Co., won first prize ($5 in gold), and Thomas Fairley, fireboss in No. 9 mine of the Milby & Dow Coal and Mining Co., Dow, Okla., won second prize ($3). The amount of gas in the machine at the different times totaled 8½ per cent. The total amount of Mastako's readings was 8½. Fairley's readings amounted to 9½.

Records of Successful Rescue Work at Mines

Another interesting feature of the first-aid work in this field is the practical result that is being obtained by the men trained. According to the doctors who were in attendance on them, two men in the district owe their lives to the prompt application of first-aid treatment during the last year. One man came in contact with a highly charged electric wire, and another was overcome by powder smoke while acting as fire runner.

Artificial respiration was applied in both cases by men who took part in this contest, and in both cases the men were revived, although apparently dead at the time they were discovered. The captain of another team stated that his men had treated at least 25 cases during the last year, their most difficult task being the splinting of a broken leg and the removal of the injured man on a pitch of 40 degrees.

A broken rule usually means a broken bone.

* * *

Get the safety habit—it's the only habit that will never injure you.

* * *

Recklessness is no indication of courage; brave men are always cautious.

* * *

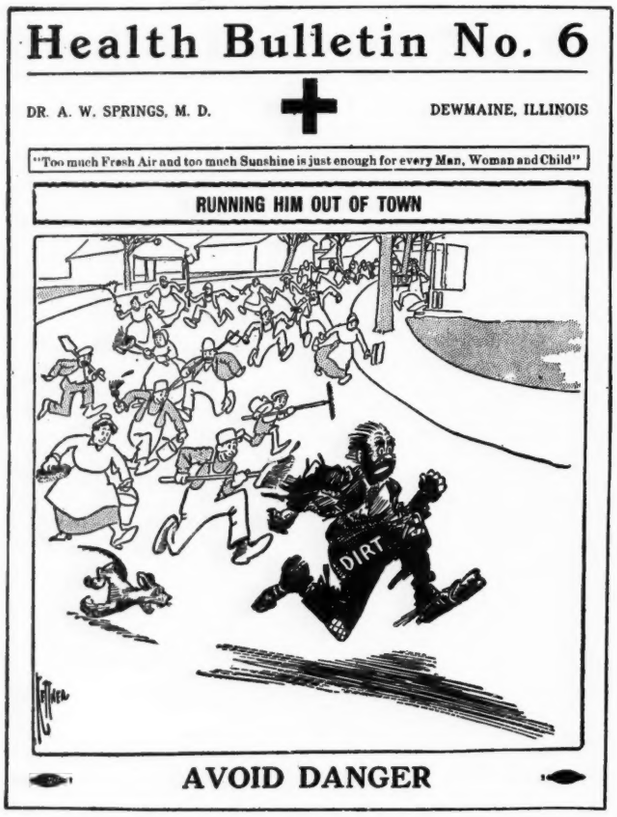
A rusty nail and a poisonous reptile are both dangerous. Turn them both down.

* * *

The slipping ladder causes approximately 6,000 deaths and 200,000 accidents every year in the United States alone. The ladder, carelessly used, is one of the most dangerous things in the world.—Edward Higgins to his California Safety Bears.

Health Bulletin for Miners

The Madison Coal Corporation at its Dewmaine mines in Williamson County, Illinois, has a large number of colored miners, and A. J. Moorshead, the president and general manager, has appointed Dr. A. W. Springs as physician. The latter is himself, by the way, a colored man. The excellence of his health bulletin, the front


Health Bulletin No. 6
DR. A. W. SPRINGS, M. D.
DEWMAINE, ILLINOIS
"Too much Fresh Air and too much Sunshine is just enough for every Man, Woman and Child"
RUNNING HIM OUT OF TOWN
DIRT
AVOID DANGER

HOW THE MADISON COAL CORPORATION AIDS HEALTH

cover of which appears herewith, shows that he has the interests of his families at heart and is fully alive to their needs.

He is holding first-aid meets at village No. 8 every Friday night and at village No. 9 every Tuesday evening. It is interesting to note the number of deaths from gunshot wounds and malnutrition recorded in this bulletin, the first being criminal and the second wholly unnecessary where conditions of living are so favorable.

The tables refer solely to the colored people of Dewmaine.

1914 Deaths from		Per Cent.
Accidents	1	5.55
Gunshot wounds	4	22.22
Tuberculosis	3	16.66
Bright's disease	2	11.11
Jaundice	2	11.11
Hemorrhages	2	11.11
Paralysis	1	5.55
Spasms	1	5.55
Malnutrition	1	5.55
Acute gastritis	1	5.55
	18	99.96

1915 Deaths from		Per Cent.
Gunshot wounds	1	7.69
Pneumonia	3	23.08
Malnutrition	3	23.08
Tuberculosis	1	7.69
Whooping cough	2	15.38
Stillbirth	2	15.38
Paralysis	1	7.69
	13	99.99

Ages at Death	1914	1915
Less than one year	5	8
Between 1 and 3	1	2
Between 14 and 20	3	..
Between 20 and 40	6	1
Between 40 and 60	2	1
Between 60 and 80	1	1

	1914	1915
Births	32	34
Deaths	18	13
Excess of births over deaths	14	21
Death rate per 1,000	..	8

On the second page of the bulletin Dr. Springs makes a number of good suggestions to his clients:

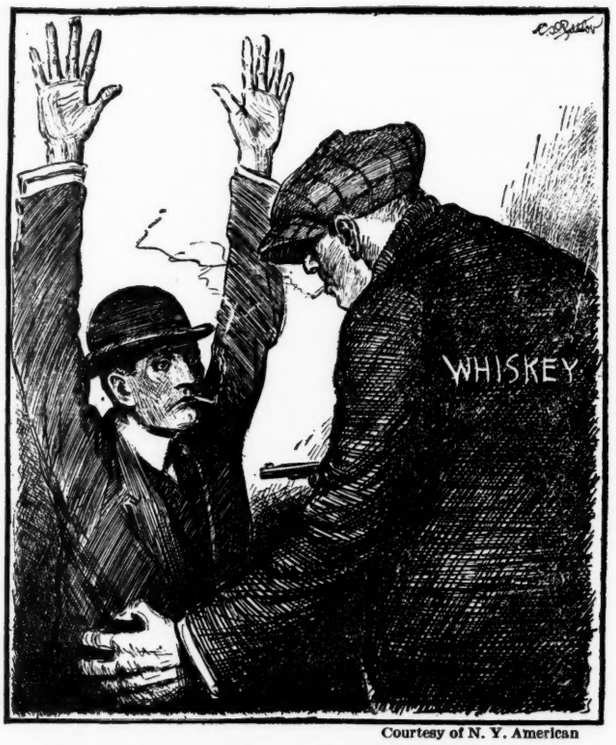
We must reduce our high death rate; dethrone disease and enthrone health and long life. We may differ on other subjects, but there is no room for difference here. Let us make a strong, long, united pull together.

You can but agree with me when I say a clean village means a healthy community. It means less sickness and crime. We are told that dirt breeds crime and diseases. A clean community means more work, better work and prosperity. Clean environments have their effect on the homes of the people. A clean camp means happier and better provided homes, healthy children and sweet comfort, and also, I am persuaded to believe, more cash in our pockets. Now listen, Neighbor, this clean-up business cannot be accomplished in a spurt followed by a rest, for to clean up, clean out and keep clean requires us to work at this job every day.

The Madison Coal Corporation will give cash prizes of $50 each this year to camps Nos. 8 and 9 for the best and neatest kept yard. If you work your little garden, it will help keep the weeds down; besides, it will afford you fresh vegetables to take the place of so much canned goods. Had you thought of that? Get busy.

Dr. Springs puts in a word for himself, and why should he not? It is taken from the New York *Medical Journal* and it explains how the doctor feels the high cost of dispensing wherever he is dispensary and doctor in one. Lest in our selfishness we overlook the company doctor's dilemma, the figures showing the increased cost of drugs are given here on the excellent medical authority just cited: Acetanilid, 400 per cent.; belladonna, 700; caffeine, 250; wool fat, 500; phenolphthalein, 700; potassium bromide, 1,500; quinine, 1,200; sage, 500; salol, 800; antipyrin, 400; carbolic acid, 1,000; calomel, 200; naphthalene, 500; phenacetin, 1,800; potassium permanganate, 700; saccharin, 600; salicylic acid, 900; and thymol, 600 per cent. The dispensing physician in Illinois has not been able to provide, like the miner, that the cost of the supplies he uses shall not be increased by the war.

Dr. Spring's two-page bulletin is so attractive that it will certainly succeed in promoting sanitary living.



Courtesy of N. Y. American

THE HOLD-UP—"YOUR MONEY AND YOUR LIFE"

Discussion by Readers

Detecting Gas by Smell

Letter No. 5—I was interested in reading the inquiry of Joseph A. Greaves, *Coal Age,* May 6, p. 815, asking if marsh gas could be detected by smell and without the aid of a safety lamp. An experience of 26 years in gaseous mines, in Scotland and in this country, leads me to answer this question in the affirmative. I am fully convinced that the experienced miner can detect this gas by smell.

Let me relate a little experience I had while firebossing in Scotland. When going my rounds in the mine, I had formed the habit of traveling in a stooped position, owing to the low height of the coal. On reaching a switch, and before entering a room, I would straighten up for a few moments. On one occasion I straightened up at the mouth of a room, only to stoop again as quickly, saying to myself, "There is something wrong here." I retraced my steps, going 20 ft. back, and started to test for gas with a safety lamp. I found the gas only 4 ft. outside of where I first detected it by smell. Many a morning I have spent from 15 to 20 min. trying to get a cap on the lamp but failed to do so, although I knew by its odor that the gas was present.

Having studied the subject of mine gases carefully, I fully realize that the leading chemists in Europe and this country all teach us that this gas is "odorless." If such is the case, a man would be crazy to enter a place to test for gas, depending only on his sense of smell and, having discovered no odor, start to light his open lamp. The fact that men do this continually shows their confidence in their ability to detect the gas by smell.

If, as we have been taught, marsh gas has no odor the only safe way for testing the gas is with the safety lamp. The study of gases as they occur in mines is an interesting one, and it is important that miners should be well informed on this question of detecting gas by its smell. This is especially true in the case of mine foremen and firebosses, whose duties are to examine the working places and see that they are safe for work.

ARCHIBALD COATS,
Majestic, Ala. Morris No. 2 Mine.

Letter No. 6—In regard to detecting marsh gas by smell, referred to in the inquiry, *Coal Age,* May 6, p. 815, I must admit that during an experience of 25 years in anthracite, bituminous and lignite coal mines generating this gas, I cannot say that I ever detected its presence by smell. During this time I have worked in places where it was necessary to keep the safety lamp back some distance in the hands of a competent person, while I pushed ahead as far as it was safe to go with the end of the brattice cloth or canvas, which I would tack to a timber so that the air current would be carried forward and sweep away the gas that had accumulated in the place. Work of this kind must often be done in attempting the rescue of men, following an explosion. At no time, however, have I been able to "smell the gas."

Old miners are often heard to state that they could smell gas and in response to their request I have raised my head into the same mixture to see if I could detect the smell, which they claimed was there, but without results. My experience is that this gas produces a dizziness, which is often accompanied by a humming sound or singing in the ears that resembles the buzzing of bees. A common phrase among miners, when this occurs, is, "She's commencing to hum."

The questioning of men who claim to smell gas, as to the kind of smell or odor, has never brought any satisfactory answer—the only statement being that it was "a peculiar smell," which they could not describe. Personally, I have ascribed the sensation to other causes than that of smell. When the nose is immersed in a gaseous atmosphere, there is often experienced a coldness or chill. The same sensation can frequently be detected by putting the hand into the mixture. I am quite certain this fact will be corroborated by other readers of *Coal Age,* but have never been able to ascribe any reason for the sensation.

While firebossing in a very gaseous mine on the Pacific Coast some years ago, I frequently heard the pillar men claim that they could smell the gas accumulated in the abandoned workings behind the pillars. These men described the odor as one resembling dry cedar. At that time I was studying the subject of gases and was interested to know if marsh gas had an odor, as the books described it as "odorless." I experimented much with the gas in this mine. I could smell the cedar that was used very extensively in this mine for cogs or chocks and for posts and lagging. As all this timber was split, it gave off quite an odor of cedar, which I concluded was what the pillar men smelt and claimed was gas.

One writer has spoken of the peculiar smell coming from the safety lamp, caused by the burning of the gas within the gauze of the lamp. I can vouch for this, as I have often detected the same odor when climbing steep pitches with my lamp hanging to my shirt collar, or suspended by a strap around my neck, or holding the lamp suspended from my mouth, which was the common custom of firebosses when climbing these pitches in the mine. With the lamp in this position, if a small percentage of gas was encountered the odor was at once detected coming from the lamp. It produced a stinging effect in the nostrils.

In conclusion, I want to say that the several mine gases rarely occur in a pure state in the mine but form mixtures of different gases in various proportions. Moreover, the different forms of oxidation constantly going on in the mine produce mixtures of gases in great variety, so that it is impracticable for a miner to state that the smell he detects is that of marsh gas. I hope to hear from others in regard to their experience.

Madrid, N. M. J. W. POWELL.

The Miner and Safety First

Letter No. 15—After reading Letter No. 10, by "A Miner," *Coal Age,* May 13, p. 857, I want to say that the careful miner has every opportunity to prevent accidents in the mine. For example, he sees a few props breaking in his room and realizes the danger in time to avoid it. Or he observes a loose piece of slate hanging in the heading and gives warning in time to save a luckless driver from being hurt by its fall.

The mine foreman cannot always see these things in time to prevent an accident, but as "Miner" says in his letter, "Miners forget and grow careless in their work." Most every miner has a knowledge of his danger, but "I don't care" is always in his mind and he argues to himself that he is "not paid for doing such extra work," even though it is a small matter and would take him but a few minutes to make right and remove the danger from another's path. He forgets that by so doing he will probably save someone's life. Perhaps a stone fallen from the roof lies on the road. It is easily removed by the miner as he passes, but he goes on and leaves it there. A motor approaches hauling a loaded trip of cars at a good speed. The motor strikes the rock and is derailed, the accident throwing the motorman under the cars, which crash over him, killing him and badly injuring his helper.

A mine foreman may talk his head off telling his miners to make their places safe, but many are ignorant and will not listen and laugh when he has gone. The foreman does not want to prosecute these careless miners, because he knows he must keep up his daily output of coal, and so he takes a chance and overlooks their carelessness. He forgets that a single prosecution of a careless miner will be a lesson to a dozen others.

Results of Inefficiency and Drunkenness of a Foreman

In one mine where I was employed the mine boss discharged one of my best friends, because he drilled his shot hole beyond the mining. I said nothing at the time but it hurt my feelings. The next Sunday I saw the same foreman go to his drinking place next door to where I lived and, before leaving, he got so drunk that he danced on a beer case before several Italian miners.

The following week I could not help saying to this foreman that he had treated my friend unjustly, since he had been used to shooting coal off the solid and did not understand that, in a gaseous mine, the practice was dangerous. From that day I became the enemy of the foreman, who tried in different ways to get me out of the mine. He double-shifted my entry, putting Italians on the night shift against me, but this did not last long.

The following Saturday evening an explosion occurred in the shaft. The superintendent and the mine boss were both drunk and in this condition went down to fight the fire, taking with them half a dozen men. The superintendent was so drunk that he missed his footing on the board thrown across the sump and fell in, bumping his head badly. When at last they reached the fire the boss ordered the men to attach the hose to the air pipe. The turning on of the air only increased the violence of the fire, which would have burned out the shaft, had not the fireboss arrived in time to discover the mistake. The following day the newspapers had an account of the fire and stated that the mine superintendent was badly hurt. OBSERVER.

Listie, Penn.

Letter No. 16—Speaking of safety in mines, permit me to relate a little of my experience and observation.

At a mine where I was employed the shotfirers were paid by the miners. There were two of them, and the mine was divided so that each side of the mine worked about the same number of men. The mine foreman was careless in not removing the dust, which will some time blow up this mine.

In order to get through with their work quicker, the two shotfirers would take separate sides of the mine, which was a dangerous practice under the existing conditions. Besides being dusty, the mine generated a good deal of gas. I have seen these shotfirers go into the mine so drunk that they would not know north from south. The drink habit is the cause of more accidents in mines than any other one thing, and I often wonder that more men are not killed on this account. I hope some day there will be laws enacted that will sweep this curse from off the earth.

Drink Causes a Fatal Accident

Let me explain further: At one time when I was driving, there were three of us working on the same parting. While I took the main north, one of my helpers took the first-east and the other the first-west entry. One morning these two men came into the mine with two pints of whisky aboard, and both were drunk. As a result, about 10 o'clock that morning they put up a bet to see which would haul the most coal. We were pulling from four to five cars a trip. I had got my trip about ready on the main north when the trapperboy signaled me to come quick. Arriving at the parting, I found a horrible sight. The two trips, from the east and west entries, had come together at the parting. One of the drivers was killed outright and the other lived only a little while. Before he died, he told me "if we had left that beer alone, Charlie, it would not have happened."

At another mine where I worked there were two motors, and each motorman was trying to see which could pull the most coal in the day's run. At the end of the shift one of these motormen was a little behind the other and decided to make another trip after the time for quitting. On his return to the shaft there were no bottommen there to sprag the cars. There was a line of men waiting for the cage, and one of these men was caught between a timber and the motor, which jumped the track. The man was badly hurt and may sue the company for $2,000, although the company provided him with the best medical care and was good to him in every possible way.

While it is the duty of every man to do his best to put out as much coal as possible, he must not be careless in doing this. He must do his work in a safe manner. He must consider always "safety first," not only for himself but also for his fellows.

——, Ind. TEETOTALER.

The Efficient Fireboss

Letter No. 11—In what follows I want to be understood as referring to an efficient fireboss as one who has had years of experience at the working face and has, moreover, passed a satisfactory examination before a competent board of examiners. I do not refer here to a man who has gotten his knowledge from books while sitting in a superintendent's or engineer's office and been able to satisfy an examining board and get a certificate of competency that will enable him to fill this position as far as the requirements of the mining law are concerned.

What struck me most forcibly in reading the different letters on this subject was the statement made by Edward H. Coxe, in letter No. 6, *Coal Age,* May 20, p. 895. Mr. Coxe says: "Aside from the mine foremen and their assistants, who are usually paid about the same as firebosses, and the shotfirers, the fireboss is about the highest paid man on the job, exclusive of skilled electricians and machinists." I wonder if he is referring to the same class of man that I have described as having gained his practical experience by many years of work in gaseous mines. I want to remind him that it takes years for a man to become a thoroughly efficient fireboss. There are many firebosses in our mines, I admit, whose work shows better on paper than it does at the coal face.

While it takes a good portion of one's life to secure a practical knowledge that makes for efficiency, it takes a comparatively short time to acquire the theoretical knowledge that enables a man to pass many examinations, as they are too often held. The certificate of competency, therefore, does not always represent the true value of the man who holds it, and the value of practical experience should not be underestimated in respect to the amount paid for such service as an efficient fireboss can render.

I have been working in mines since 1881, getting experience, and am still adding to that experience every day. I have been a miner, driver, roadman, bratticeman, shotfirer, pumpman, roadboss and fireboss, besides serving my time as a man of general work. My mining experience began as a laborer, which I am not ashamed to say. Before making such statements, men like Mr. Coxe should consider more carefully the character of the work performed and the time that has been consumed in gaining the necessary experience. W. T. W.

Curtisville, Penn.

Letter No. 12—I note with much surprise that Edward H. Coxe, in letter No. 6, *Coal Age,* May 20, p. 895, takes exception to many of the statements made by "Old Fireboss," in a previous letter.

It seems strange to me that a man with the mining knowledge and the high official position of Mr. Coxe should regard the work of the fireboss with so little consideration and criticize so severely the statements of an old fireboss when seemingly no criticism is due. I want to say that these statements of "Old Fireboss" are worthy of greater respect, because I firmly believe he is conscientious when he says he has an arduous task to perform. His limited amount of education leads him to explain in a modest and common way the conditions affecting his work in the mine.

While Mr. Coxe admits that the fireboss goes into the mine in "the dead hours of the night," and that his job "is a mighty lonesome one," he concludes, "Still I do not think he [the fireboss] takes any more chance than most other mine workers of being overcome with poisonous gas or struck down by falling roof, or burned by walking into an unsuspected body of gas that may be ignited by his lamp."

When preparing to enter the mine, the efficient fireboss will carefully examine his safety lamp to see that the oil vessel is well supplied with oil, the gauzes in perfect condition, and the lamp properly put together. He will note that the ventilating fan is running at its customary speed, and that the water gage shows a normal mine pressure. Admitting that he has done all this, and that on descending the shaft he has observed that the main air current is passing into the mine in the usual quantity, one must yet acknowledge that danger still lurks in the path of a fireboss who will carefully and conscientiously perform the duties of his position.

Dangers to Which a Fireboss Is Exposed When Examining a Mine

The man is alone in the mine, and a fall of roof may occur in the territory he has already examined and obstruct the air in a section of the mine he has yet to enter. Or a trapdoor controlling the ventilation in that section may be open, which he has yet to discover. He must hunt up the cause of trouble, since his safety depends on his own efforts. Assuming that he is working in a very gaseous mine, I say he may very often be placed in a critical position in respect to his own safety. In my opinion, a fireboss alone in such a mine takes far greater chances than 90 per cent. of the miners working in the same mine.

As stated by "Old Fireboss," he is liable to be overcome with poisonous gases or burned by advancing too far into an unsuspected body of gas. It may often happen that a thin stratum of gas flowing out of a chamber along the roof will escape a fireboss' notice as he passes in to the working face, while his movement along the road disturbs the gas and brings it down so that he suddenly finds himself enveloped in a dangerous atmosphere. On later observing this condition he carefully lowers his lamp to the floor or smothers it under his coat as he attempts to retreat.

In respect to the danger of being caught under a fall of roof, the chances of a fireboss exceed those of the miner, driver or machine runner, because he must proceed with only the dim light of his safety lamp. He travels over a greater distance and encounters a greater number of these dangers than the men who work in a single place or travel but one route in the mine. Moreover, it frequently happens that, owing to lack of time at the end of a shift, a miner or loader may leave a loose slab of slate or a "hanging shot" unsupported that the fireboss approaches unwarned. Again, a miner who is injured by accident in his place receives immediate help from his work fellows, while a fireboss if injured on his rounds may lie for several hours before help can reach him, and this delay makes his chances of recovery far less than if he had received prompt attention and aid.

The suggestion of Mr. Coxe, that the fireboss may have run into danger with an open light, is hardly worthy of

consideration in respect to an old, experienced fireboss. While it must be admitted that an open light in the hands of a fireboss has been the cause of disaster, I want to say that such a practice if known to the mine management should at once disqualify the man from further service in that capacity.

Referring to the fact that a fireboss is often given a larger territory than he can properly examine, Mr. Coxe speaks of himself having walked 12 mi. in 6 or 9 hr. underground and doing considerable work at the same time. I do not doubt this statement, but would add that his performance was not an everyday act or duty, compelling him to rise at 1 o'clock in the morning and travel the mine alone. I hold there is no comparison between the work of a fireboss and that of an engineer who must travel semi-occasionally throughout the mine in the discharge of his duties. In closing, I want to add that any state law that permits a fireboss to examine the mine from 6 to 9 hr. before the time for the men to enter for work needs a radical change. FIREBOSS.

Millfield, Ohio.

Letter No. 13—Kindly permit me to offer a few comments on Letter No. 4 by "A Former Fireboss," May 20, p. 893. The letter is from West Virginia, and is written with the hope expressed that it "will help to make the work of the fireboss better understood and appreciated." I note that the writer, though formerly a fireboss, as he states at the beginning of his letter, is not employed as such at the present time, and I surmise that his line of thought may possibly explain the reason for this.

Having had experience myself in West Virginia, and having known a few firebosses who were contented, although they had not received the consideration accorded this "former fireboss," I must say that I have found them a very highly appreciated class of men—appreciated because of the importance of their duties and the integrity of the men who will conscientiously perform the duties required of that office.

FIREBOSS CANNOT START EXAMINATION BEFORE 4 O'CLOCK IN THE MORNING

The writer of the letter assumes, for the sake of illustration, that he is just taking up the duties of a new fireboss and, in his anxiety to make good, he rises "at 1 o'clock in the morning" and enters the mine "about an hour later." Now, referring to the West Virginia state mining law, as revised by the Legislature in 1915, we find that "such examination and removal of said gases shall begin within 3 hr. before the time each shift commences work." Work starts in the mines of West Virginia at 7 a.m. and the hour for beginning the examinaion of the mine by the fireboss would not be earlier than 4 a.m. If a fireboss starts his examination at 2 a.m. in West Virginia, he not only takes an unnecessary hardship upon himself, but violates the state mining law as well.

Again, this "former fireboss" laments the fact that his authority in the mine is not "more commensurate with his responsibility and accountability," and adds, "I have realized that to develop into something bigger I must keep everlastingly at it." In this connection, permit me to refer again to the state mining law and quote from section 61, which reads as follows:

In the performance of the duties devolving upon the firebosses, they shall have no superior officers; but all the employees working inside of said mine or mines shall be subordinate to said fireboss, or bosses, in his particular work.

This section of the law, it seems to me, gives the fireboss sufficient "authority" to satisfy the most eager and ambitious man in the office.

CREDIT TO WHOM CREDIT IS DUE

Speaking of receiving "no share in the credit" for a record run, I would reply that it is not the duty of the fireboss to oversee the operation of the mine and produce by his efforts a large tonnage. While it is true that the fireboss examined the mine in the morning, according to his regular custom and reported it safe for work, it is only fair to ask, What did the fireboss have to do with getting the coal cut, loaded and hauled out of the mine, to say nothing of securing labor sufficient to produce such a big day's output? The writer of the letter has seemingly overlooked the fact that the foreman is the man who is responsible for the production of coal and who must answer many serious questions when placed "on the carpet," and asked to "please explain." Moreover, I can see no reason why a man who is doing his work properly should object to explaining results when asked.

Nor is it strange that when a mine foreman goes to look over a piece of work, he naturally wants the assistance and advice of the man who is a specialist in that line and who will be held responsible for the completion of the task. The average foreman does not have time to go over all the trackwork and timberwork that must be done in the mine and must, therefore, give his instructions to the men who will have charge in each class of work. But I would add that a wideawake foreman will send trusted men to do the work and not to look at it.

PROMOTION THE REWARD FOR COMPETENT WORK

In West Virginia the foreman of a mine is required by law to have a certificate of competency granted by a duly authorized examining board after having passed an examination designed to test his qualifications and ability to fill the position of mine foreman. In the majority of cases, I may say, the mine foreman has worked up from the position of fireboss and received his promotion by attending studiously to his own business and performing well the work left in his charge.

In closing I want to say that discipline is one of the greatest factors in successful mine management. In order to gain the confidence of his superiors, any man working in the mine must carry out the orders given to him without stopping to argue or question. Mining companies are ever on the alert for young men to whom they can give authority and positions of responsibility and trust, and the men who usually get the promotion are those who do well and satisfactorily the work assigned them in a subordinate position. I do not wish to be understood as, in any case, failing to give the well-deserved support to firebosses as a class. As I have stated in the beginning of this letter, I consider the judgment and integrity of these men of special significance, or they would not hold this position any length of time. C. O. MESSENGER,

Asst. Gen. Supt., Madeira-Hill Coal Mining Co.

Philipsburg, Penn.

Inquiries of General Interest

Mining Thin Coal Seams

I would like to hear from readers of *Coal Age*, especially those who have had actual experience in the mining of such seams as I describe, as to what they consider the best method of working the coal, in each case taking into consideration the economical extraction of the coal, maximum production and recovery and describing in a general way the system of timbering, haulage, drainage and ventilation, and giving any experience had in the use of coal-cutting machines under certain conditions.

The seams may be described as follows:

Seam No. 1—This seam is a high-grade bituminous coal 3½ ft. thick, overlaid with a very bad roof, which consists of a heavy clayey shale cut across its bedding plane by numerous slips.

Seam No. 2—This is an anthracite seam, split by a soft shale parting having an average thickness of 20 in. The upper coal is 32 in. thick, while the lower coal beneath the parting is 14 in. thick. The floor of the seam is shale.

Seam No. 3—This is also an anthracite seam, in two layers separated by a parting of hard shale having an average thickness of 27 in. The upper coal is 14 in. thick, while the lower coal is 26 in. thick. Here also the bottom or floor of the seam is a shale.

Los Cerrillos, N. M. SUPERINTENDENT.

We submit these questions to readers for their suggestion and experience. The mining of the two double seams of anthracite, separated by shale partings of different thickness, should prove an interesting question for discussion. We hope it will receive the attention it deserves.

An Interesting Question in Mine Accounting

We have an interesting problem in reference to keeping account of the amount of coal cut by machine runners in our mines. We would like to see this question discussed by the readers of *Coal Age*, in the hope that a more simple method can be found of keeping account of the coal cut by each machine when miners finish their places and are transferred to another section where their coal is cut by another machine. The facts in the case are as follows:

It has been our custom to pay each machine runner according to the amount of coal produced in his territory. Each machine cuts the coal for 20 men. As long as these men remain in the same place, or in the section cut by the same machine, there is no trouble. But the difficulty begins when a miner finishes his place and is transferred from one section to another where the coal is cut by another machine. Naturally, the transfer of the men causes some confusion in keeping the account straight in respect to the amount of coal cut by the different machines.

There should be some easy method of overcoming this difficulty and simplifying both the coal sheets and the office accounts, and show correctly the miner's coal and the coal cut by each machine. What is desired is a method that will not necessitate excessive changes in the current bookkeeping. CONSULTING ENGINEER.

Chicago, Ill.

There is little doubt but that the many readers of *Coal Age* have experienced similar difficulty in the keeping of mine accounts, and will be able to suggest a simple method that will show at once and clearly the amount of coal cut by the miner and the amount to be credited to each machine runner. It would seem that the simplest plan would be to retain the same check numbers, 20 in all, in the section cut by each respective machine and when a miner goes to another section, give him another check number, or give each machine a letter, A, B, C, etc., which would follow the miner's check number, as 20A, etc. We hope for some good suggestions along this line.

To Rewind an Armature

For some time past I have been reading the interesting answers given to the inquiries in *Coal Age*, and would like to ask if you can give me the necessary information that would enable me to rewind a Westinghouse armature, type S, having 90 commutator bars and 45 slots. This is a 75-hp. armature. Kindly explain, also, what is meant by the "throw of the coils," and how this is determined; also, the "throw" in connection with the leads.

Elizabeth, Penn. MINE MECHANIC.

It would be impracticable to attempt to explain in detail the method of rewinding an armature. The best advice we can give this correspondent is to observe and make careful notes of all the connections before stripping a machine of its present windings, and then follow the same order and use the same size of wire when rewinding the armature. This work can only be successfully done by a competent and painstaking mechanic or one who is thoroughly familiar with electrical work. Another method would be to apply to some reliable repair shop for electrical machinery and let them rewind the armature.

In case new coils are desired, they can be obtained from the Westinghouse Electric and Manufacturing Co., East Pittsburgh, Penn. In a case like this it is always a better plan to write for the information desired directly to the manufacturers of the machine.

The expression "throw of coils" has reference to the number of poles in the machine. For example, a four-pole machine has a quarter throw and an eight-pole machine, one-eighth throw. The expression "throw of leads" has reference to the connections which may be in parallel or in series, and are quite variable in different machines.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—What is the safe center load that a white-oak beam will support when the length of the clear span is 8 ft. and the beam is 10 in. wide and 14 in. deep? Assume a coefficient of safety of 5 and an ultimate fiber stress for this timber of 10,000 lb. per sq.in.

Ans.—If the ultimate fiber stress is 10,000 lb. per sq.in., taking a factor of safety of 5, the safe fiber stress is 10,000 ÷ 5 = 2,000 lb. per sq.in. Then, assuming the beam is supported at both ends, the safe center load is

$$L = \frac{2}{3}\frac{fbd^2}{l} = \frac{2}{3} \times \frac{2{,}000 \times 10 \times 14^2}{8 \times 12} = 27{,}222 \text{ lb.}$$

In this formula L equals the safe center load in pounds; f, the safe fiber stress; and b, d and l, the breadth, depth and length of span of the beam, all expressed in inches.

Ques.—(a) What size of air compressor will be required to furnish the air necessary to operate forty 2.5-in. drills, under a working pressure of 75 lb. per sq.in., at an elevation of 5,000 ft. above sea level?

Assume the efficiency of the compressor as 85 per cent. and estimate on a speed of 100 r.p.m. and a stroke of 30 in. (b) Calculate the mean effective pressure (m.e.p.) in the air cylinder and the horsepower and diameter of the steam cylinder.

Ans.—The first step in this solution is to find the quantity of air required to operate the drills. This has been determined by manufacturers by means of a direct test on drills of different sizes operated at a pressure of 60 lb. gage. Basing the estimate on the volume required to operate ten 2.5-in. drills at sea level, which is given as 450 cu.ft. of free air per min., the quantity of air required in this case will be 4 × 450 = 1,800 cu.ft. per min. at 60 lb. gage, sea level. But since the volume of air varies inversely as the absolute pressure, the quantity of free air required when operating under 75 lb. gage, at sea level, will be

$$1{,}800 \times \frac{75 + 15}{60 + 15} = 2{,}160 \text{ cu.ft. per min.}$$

Again, when operating at any elevation above sea level, it is necessary to multiply this volume by what is termed an "altitude factor," which depends on both the atmospheric pressure and the gage pressure. The atmospheric pressure at an altitude of 5,000 ft. above sea level is practically 12 lb. per sq.in., while the sea-level pressure may be taken as 15 lb. per sq.in. in making this calculation, which gives for the volume of air required to operate forty 2.5-in. drills at 75 lb. gage and an elevation of 5,000 ft. above sea level,

$$2{,}160 \times \frac{15(12 + 75)}{12(15 + 75)} = 2{,}610 \text{ cu.ft. per min.}$$

Now, since the efficiency of the compressor is 85 per cent., the actual piston displacement required for this operation will be 2,610 ÷ 0.85 = 3,070 cu.ft. per min. The area of the air cylinder is then calculated from this total volume by dividing the latter by the piston speed expressed in feet per minute, which is (2 × 30 × 100) ÷ 12 = 500 ft. per min. The area of the piston is, therefore, 3,070 ÷ 500 = 6.14 sq.ft., or 884.16 sq.in. The diameter of the air cylinder is then.

$$d = \sqrt{\frac{884.16}{0.7854}} = \text{say } 33.5 \text{ in.}$$

The mean effective pressure in the air cylinder must be calculated by means of logarithms, using the formula,

$$M.e.p. = 3.47 \times 12\left[\left(\frac{12 + 75}{12}\right)^{0.29} - 1\right]$$
$$= 32.3 \text{ lb. per sq.in.}$$

Then, assuming the efficiency of the steam engine driving the compressor as 80 per cent., the horsepower required is

$$H = \frac{32.3 \times 884.16 \times 500}{0.80 \times 33{,}000} = 541 \text{ hp.}$$

Finally, assuming a mean effective steam pressure of 50 lb. per sq.in., the sectional area of the steam cylinder will be

$$A = \frac{33{,}000 \times 541}{50 \times 500} = 714.12 \text{ sq.in.}$$

The diameter of a cylinder having this area is

$$d = \sqrt{714.12/0.7854} = \text{say } 30 \text{ in.}$$

Ques.—An engine cylinder is 12 in. in diameter and 18 in. long. What is its sectional area, also its cubical contents?

Ans.—The sectional area of the cylinder is 0.7854 × 12^2 = 113.1 sq.in., nearly.

The cubic contents of this cylinder is then 113.1 × 18 = 2,035.8 cu.in., or 1.178 cu.ft.

Ques.—Describe the changes that take place in the air of a mine at the moment of an explosion of firedamp.

Ans.—The oxygen of the air combines with the carbon of the marsh gas in the firedamp to form carbon dioxide when the supply of air is plentiful. If the supply of air is more limited, varying proportions of carbon dioxide and carbon monoxide are formed. The oxygen of the air also combines with the hydrogen of the marsh gas in the firedamp to form water (H_2O). The nitrogen of the air remains unchanged, while there is generally some unburned methane or marsh gas also remaining after the explosion. The reaction that takes place in this explosion is expressed by the chemical equation

$$CH_4 + 2O_2 + 8N_2 = CO_2 + 2H_2O + 8N_2$$

The numerals standing before each symbol indicate the relative volume of the gas, the symbol alone representing a single volume. Thus, one volume of marsh gas consumes two volumes of oxygen and produces one volume of carbon dioxide and two volumes of water vapor. The two volumes of oxygen with the eight volumes of nitrogen represent ten volumes of air.

Coal and Coke News

Washington D. C.

In a decision rendered upon the complaint of the Brush Creek Mining and Manufacturing Co. and others the Interstate Commerce Commission approved the existing basis of carload rates of the Cumberland and the Louisville & Nashville railroads on coal from mines on the Cumberland R.R. to the Northwest and the Southeast. The Commission held that these rates are not discriminatory because they exceed group rates of the Louisville & Nashville R.R. to and from the same territories from and to mines on that road, but the Commission held them to be unreasonable to the extent that they exceed such group rates by more than 5c. per ton. The roads were required to publish rates on this basis on and after Aug. 21 next. The Commission also held that the rates on inbound supplies to mines on the Cumberland R.R. are not unreasonable or discriminatory.

In its decision the Commission said:

We do not think that the law imposes upon a railroad the duty in all cases to give to mines on a connecting independent railroad the same rates to market that it gives to mines on its own branch lines in the same region, and the mere fact that the L. & N. refuses to extend to complainants' mines on the Cumberland R.R. its Pineville rate applying from mines on its own branch lines does not give to the mines on the branch lines of the L. & N. an undue preference, or subject complainants' mines to undue prejudice.

Commissioners Harlan and Daniels dissented from the opinion of the majority, Commissioner Daniels pointing out:

The consistent application of the present holding would be to disintegrate the group and to graduate charges according to the distance of the respective hauls therein. It is not unlawful for a carrier to make a reasonable grouping of mines on its own rails and to blanket the rates thereon. A fortiori, it is not unlawful or unreasonable in the instant case for the Louisville & Nashville to obtain as its division of the rate on coal originating on connecting lines an amount no greater than it obtains for hauls within the group on coal from mines on its own rails.

Hearings Are Begun

Hearings in the lake cargo coal cases were begun by the Interstate Commerce Commission June 14. In this instance the Commission combined the case known as the Lake Cargo Coal Rates case, and the case of the Pittsburgh Coal Operators Association against the Pennsylvania Co. et. al. In this investigation the Commission will again go into the subject of the reasonableness of the rates on coal from the West Virginia, Pennsylvania and Ohio fields to the lake ports intended for shipment beyond. The Commission is expected to determine the comparative rates between the various fields and the lake ports, which has been a subject of dissent for a long time.

Lands May Be Relinquished and Others Received

The Senate has passed and sent to the House a bill authorizing the Secretary of the Interior to permit the Denison Coal Co. to relinquish the lands embraced in its existing Choctaw and Chickasaw coal lease, all of which have been demonstrated to be not valuable for coal. The bill would permit the same company to include within its lease in lieu of the lands released other lands which are within the segregated coal area and unleased amounting to 960 acres, more or less:

Provided, that if the surface of said lands has not been sold in accordance with the provisions of the Act of Feb. 19, 1912 (37th Statutes at Large, page 67), the said Denison Coal Co. shall have the right to use only so much of the surface of said lands as may be reasonably necessary for the purpose of carrying on mining operations, not to exceed 5 per centum of such surface, the number, location, and extent of the tracts to be so used to be approved by the Secretary of the Interior, and said company shall purchase the surface of the tracts so used for mining operations in accordance with section two of said Act:

Provided further, that should the surface of said lands have been sold in accordance with the provisions of said Act of Congress approved Feb. 19, 1912, the said Denison Coal Co. shall acquire such portions of the surface as may be reasonably necessary for prospecting or for the conduct of mining operations as provided in section three of said Act:

Provided further, that the said Denison Coal Co. shall pay all amounts due and unpaid under its existing lease before the said company shall be permitted to include the above lieu lands in the lease, and that all moneys which shall have been paid by the said company under its lease as advance royalties shall be credited on the royalty on production from the lieu lands in accordance with the terms of the lease.

HARRISBURG, PENN.

One of the most important issues ever taken before the conciliation board was presented recently in the protest of miners employed by the Delaware, Lackawanna & Western Railroad Co. against the practice of letting contracts to individual miners for mining coal after machines, such contractors employing other miners and laborers whose rates he fixes. The miners contend that the letting of such contracts is contrary to the agreement of May 5, 1916, in that it makes the contractor a third party to this agreement.

If the miners are sustained in their position, it practically means the concession of two more of the demands which were made upon the operators, in New York—one for the abolition of making individual agreements and the other for the complete elimination of the "contractor" system. It developed during the hearing that the operators have a parole agreement with the mine workers, made in New York, to do their best toward the elimination of the system of contract mining.

The grievance upon which the case is based, originates in the National colliery, at Scranton, where the men went out on strike, but had voted to return to work pending a hearing by the board.

The procedure of the hearing was somewhat irregular, in that the argument on the question was heard first and the testimony taken afterward. This developed from the fact that Mr. Connell and Mr. Dempsey admitted the facts in the case and simply asked for an interpretation of the agreement of May 5, 1916, as to whether it made the letting of general contracts legal. Mr. Connell declared that the second paragraph of the agreement specifically declares that the right of the operator to establish machine mining shall be unquestioned and that the "method" to be employed shall be at his option. He declared that he had investigated the practice of contracting at the National colliery and that he found the general contractors paying higher wages to their employees than the other miners and laborers were receiving, and that he failed to see how the other miners are being hurt.

Mr. Dempsey, president of District No. 1, on the other hand, declared that the parole agreement reached in the New York conference applied as much to machine mining as to mining from the solid, and declared that there was even more opportunity under machine mining "for the exploitation of our people."

No contractor has the right to enter into an agreement with the coal companies he contended. When he does that he makes our organization the third party in an agreement.

After the issue was presented in proper form to the board, Mr. Dempsey, for the miners, and Mr. Inglis for the Delaware, Lackawanna & Western Railroad Co., each presented statements setting forth their contentions.

Mr. Dempsey said:

In several collieries of the Delaware, Lackawann & Western Coal Co., there exists a condition whereby contracts have been given to individual miners for mining coal after machines, covering sections of certain veins and employing a number of other miners and laborers whose rates said contractor fixes. We hold that the letting of such contracts by the company is a violation of existing agreements between Districts 1, 7 and 9, representing the Anthracite Mine Workers' organization, parties of the first part, and the Anthracite operators, parties of the second part; and that instead of letting contracts in the manner above mentioned, the rates should be fixed by the company in accordance with the machine mining contract of May 5, 1916, wherein all miners and laborers should either work by the day for the company, or at contract rates fixed by the company in accordance with the said contract; and that it is not within the right of the operator to contract with a third party under the terms of the agreement of May 5, 1916.

It was brought out at the hearing that Col. Phillips, as General Manager of the Lackawanna company had promised the elimination of the contract system, and that prior to leaving the service of the company had begun to put this promise into effect.

Mr. Inglis said:

The Delaware, Lackawanna & Western Co. has several collieries where mining machines are used to undercut coal under contract, as alleged in the complainants statement. We hold that from the fact that in the contract of May 5, 1916, a base price was provided for the payment of the various employees where mining machines are used, we be-

lieve it is entirely within our rights, and not a violation of this or any agreement, to make such contracts, and to use such methods in the mining of coal where mining machines are used that will tend for the best interests of our various operations.

The company further contended that the miners who worked for general contractors fared even better than they would as individual contractors, and that the other miners in the same locality were not hurt by the introduction of machine contractors. The miners declared that they are hurt by the favoritism shown to the contractors in the matter of supplying cars. They contend that in the interests of safety one man should not be allowed to work more than 50 ft. at a time.

Hernia, a Compensable Injury

The workmen's compensation board, in an opinion filed by Commissioner Leech, rules that hernia constitutes an "injury by accident," and if sustained in the regular course of employment entitles a worker to compensation, even though there may have been a "congential predisposition to hernia," or a "previous injury that had caused a slight break in the abdominal walls."

The decision is one that has been eagerly awaited by the employers and the insurance companies of the state. If it is not carried into court on a question of law and stands as the precedent underwriters will insist it will be necessary to readjust their rates to take care of the flood of hernia claims that will inevitably appear.

The board's decision which is made in the case of James Smith vs. the Pittsburgh Coal Co., represents an effort to standardize the findings of the various referees by furnishing them with a review of existing law and the pertinent medical facts. Up to the present time no two referees have followed the same rule in their hernia case findings.

James Smith, the referee found, while in the course of his employment in the defendant's mine, was assisting his father in putting a coal car upon the track. The father put his weight on one end. The claimant, lifting on the other end, sustained an umbilical hernia or rupture.

The referee awarded compensation, and the coal company appealed. Commissioner Leech points out that it has been a settled law in England since 1903 that nothing more is required to constitute an "injury by accident than that the harm which the workman sustains be unexpected."

The coal company, however, contended that, while Smith had sustained a rupture, his injury was simply an aggravation of a condition that had previously existed. In this connection Commissioner Leech says:

> The workmen's compensation law does not prescribe any standard of health or physical condition to which the workman must conform to qualify for compensation, not does it imply a warranty on the employee's part that he is free from latent disease or physical defect which may develop into serious injury.

While the compensation board has outlined the case for the benefit of the referees, and has given workmen wide grounds upon which to secure compensation, the insurance companies are protesting against the finding. While an appeal to the courts on a point of law has been threatened, no action along that line has been taken.

In another case—that of Frank Kline vs. the Susquehanna Coal Co.—Chairman Mackey holds that a parent is entitled to compensation when a wage earning child is killed, even though he be only partially dependent upon the earnings of that child.

In the case of Mary Lynn vs. the Pennsylvania R.R., Chairman Mackey, reverses the decision of the referee. Mrs. Lynn, although married, and amply supported by her husband, had been awarded compensation because of the death of an illegitimate son, who had turned his earnings over to his mother.

PENNSLVANIA

Anthracite

Pittston—Sixty-one candidates took the examinations for State certificates as mine foreman and assistant mine foreman held for the Eighth and Ninth Anthracite inspection districts in the Pittston Y. M. C. A. on June 6 and 7. In the Ninth district there were 20 candidates, 10 of whom had already qualified as assistant foremen. In the Eighth district, of the 41 applicants, 16 were already assistant foremen.

Hazleton—The operations of the Harwood Coal Co., tied up by a button strike for some time has resumed work, as several employees who had been in arrears in dues, have paid up.

On account of the new anthracite agreement dating from the 1st of April last the miners of the Lehigh Coal and Navigation Co. have just been paid $40,000 extra for the period dating from that time to date.

Mahoney Plane—Frank and Harry Glowssen, brothers and Edward Wand and Michael Siola, who were entombed behind a heavy fall of coal and rock at Lawrence Colliery of the Madeira-Hill Coal Co. at two o'clock, p.m., June 7, were rescued at 10 o'clock on the night of June 8. The men were employed in robbing pillars in the Buck Mountain vein when the fall closed the gangway. The rescue work was under the direction of Superintendent John Price and the state mine inspectors who had to tunnel for a considerable distance to get to the men. The victims and rescuers were frequently in communication with each other by means of rapping.

Wilkes-Barre—Two section foremen employed at the Station Colliery of the Lehigh & Wilkes-Barre Coal Co., were recently seriously injured and four other men were painfully bruised by the bursting of an air hose which they had been repairing. The foremen were taken to the city hospital.

Eight students of the mining school conducted by the Y. M. C. A. were graduated on June 9, with exercises. This makes 25 who have finished the course. In addition to their certificates the graduates received the fees which they have paid into the school during the last three years. The graduates were Mathew Carlin, Elijah B. Dodson, Thomas Handley, Isidor Hochreiter, F. B. Nash, Willard Prynn, Thomas Richards and Thomas H. Smith. Charles Enzian, Division Engineer of the Philadelphia & Reading Coal and Iron Co., and one of the founders of the school, made the principal address, reviewing its history.

Pottsville—Inside and outside, all monthly employees of the Philadelphia & Reading Coal and Iron Co., were agreeably surprised on June 10, to receive an increase of $5 per month in their pay envelopes, effective May 1.

Beaver Meadow—The stripping operations in this vicinity and at Harleigh, Oneida and Ebervale, conducted by the Pennsylvania Quarry Co., have been resumed after an idleness of four weeks. The men have returned to work at an increase in pay.

Bituminous

Greensburg—The probabilities appear to be that all the big coal companies in Westmoreland County as well as other concerns employing large numbers of men will grant their employees leave of absence to go to military training camps. Recently H. C. Frick Coke Co. notified its employees that all who cared to avail themselves of such training would be given leave of absence. H. F. Bovard, general superintendent of the Keystone Coal and Coke Co., stated on June 5, that any employee of that concern would be at liberty to arrange for such training.

Uniontown—The discharge of all agents employed by the distilleries and brewers of Fayette County is urged in a petition presented to the Court on June 5 and signed by virtually all of the coke companies operating in the county. The employers assert that with business booming and labor working at high pressure, it is urgent that every precaution be taken to prevent unnecessary accidents. The necessity for sobriety is emphasized. The court is urged to curtail in every legitimate manner the sale of intoxicants in large quantities to employees of the coke works, the prosperity of the county, it is asserted, depending largely upon this industry.

About 250 members attended the second meeting of the newly organized Frick Employees Fraternity, held recently in the amusement hall at Leisenring No. 1. Eleven different Frick works were represented, these being Lamont, Juniata, Colebrook, Davidson, Leisenring Nos. 1, 2 and 3, Bitner, Youngstown, Trotter and Broadford. The next meeting will be on July 6 in the auditorium of the Dunbar Township high school.

Connellsville—The weekly production of coke for the week ending June 3 amounted to 431,872 tons. Compared with the previous week this shows that while furnace production was practically the same, 6,000 tons less coke was made in merchant ovens.

DuBois—As a result of the working conditions existing in the coal industry in this section, there is a great scarcity of men at several operations, and some of them are advertising for miners.

Charleroi—The wage-scale difficulty starting in May badly demoralized the river coal trade, this demoralization continuing to the present time. Such was the effect that the total shipments through Lock No. 4 were cut from one-third to one-half although the time of suspension was brief.

WEST VIRGINIA

Cranco—The Lunsdale Coal Co., George M. Jones, president, has added to its equipment two 6-ton gathering locomotives; the Lorain Coal and Dock Co. four 5-ton gathering locomotives and one 13-ton haulage locomotive.

Stotesbury—The E. E. White Coal Co., C. R. Stahl, chief engineer, is opening another mine in the Pocahontas No. 3 vein. This company will shortly let a contract for the building of about 40 new houses.

Logan—The Logan Mining Co., J. J. Ross, general manager, is adding many improvements to its plant in this field. A contract for a number of new miners' cottages has been let to the Diamond Construction Co., of Huntington.

Leewood—The mines on Cabin Creek are working quietly and more men are coming into the field. Were it not for a short car supply, the mines would be showing a record output. The new dwelling houses being built at the United plant are occupied as fast as one is completed. The Cabin Creek Consolidated Coal Co. is painting all of its buildings. A contract has also been let for 40 additional houses for this company at Kayford. Two hundred additional mine cars have also been ordered.

KENTUCKY

Pineville—Damage of $3,000 was done to the blacksmith and machine shop of the Log Mountain Coal Co., at Harrison, which was struck by lightning recently.

Middlesboro—In spite of the fact that miner's earnings in many of the eastern Kentucky mines are greater at this time than ever before, a spirited controversy has developed between the Consolidation and the Pioneer coal companies and their employees. The Pioneer Coal Co. mines are closed down with a small outlook for immediate resumption and M. S. Barker has declined to negotiate with any more committees of the miners from his operations, and takes the position that if they return to work it must be on the open-shop principle. At a recent mass meeting the strikers adopted resolutions in which they stated their determination not to return to work under present conditions.

OHIO

Athens—A scale for low coal to cover the mining in coal beds in the Hocking field less than 5 ft. in thickness has been demanded by the Hocking mine workers. The operators have refused to consider the payment of any differential for low coal, claiming that the Logan agreement covered all disputed points. There has never been a low-coal scale in the Hocking field. The present controversy affects about 1,000 miners.

ILLINOIS

Taylorville—The Peabody interests have recently invested $15,000 in new steel rail to extend the trackage in the Peabody mine here. Two mines in Taylorville will soon be running to full capacity it is predicted.

Springfield—Differences between mine operators and miners of Franklin County over the ventilation of mines have been amicably settled by the State Board of Mine Examiners. Operators who attended the session of the board at which the settlement was reached were W. S. Burris, of Sesser, F. J. Jacobs and E. E. Jacobs of Christopher, Fred Schroeder, of Chicago, T. C. Keller, of Chicago and T. F. Homes, who has mines in Thayer, Virden and Franklin counties.

Carlinville—A hospital is to be established it is reported by the United Mine Workers either here or at Gillespie. A committee of the Governing Board of the United Mine Workers of Illinois is considering sites in each town. An announcement is to be made in a few days of the site selected.

Belleville—A jury in the Circuit Court has rendered a verdict granting to Philip Neurnberger a writ of mandamus against the Kolb Coal Co. requiring the company to permit a surveyor to enter its mine at New Athens and make a survey. Neurnberger thinks the company has undermined his land. He was refused permission to send a surveyor down and appealed to the court.

Fire broke out a few days ago in the operation of the St. Louis & O'Fallon Coal Co., near Belleville, locally known as the Nigger Hollow mine. It was caused by a blast discharged by shot-firers during the night. The face of the coal became ignited and could not be reached by fire-fighters because of the smoke. Smoke helmets were sent from St. Louis and after several hours' fight the flames were extinguished.

PERSONALS

A. C. Jenkins has been appointed Local Auditor of the Maryland Division of The Consolidation Coal Co., with office at Frostburg, Md., vice L. C. Nied, deceased.

Albert E. Yetter, inspector for the Pennsylvania Coal Co. in the northern division, has resigned his position to become assistant superintendent of the Nanticoke district of the Susquehanna Coal Co.

Stanley Torbet recently returned to Lonaconing, Md., from Pittsburgh, Penn., where he had been employed for six months to accept a position as engineer with the Maryland Coal Co.

Joseph Struthers recently accepted the office of treasurer for the Federal Export Corp., and the Federal Shipping Co. He has offices in the Trinity Bldg., 111 Broadway, New York.

E. T. Stotesbury, H. P. McKean, H. C. Frick, George F. Baker, Daniel Willard, Isaac Heister, Joseph E. Widener, Alfred H. Smith and William L. Kinter were recently reëlected directors of the Reading Co. at the annual stockholders meeting.

Lyell Buttermore, formerly payroll clerk for the H. C. Frick Coke Co. at Bitner, has been transferred to Adelaide as yard boss. Robert S. Morton, supply clerk at Leisenring No. 1, has been made material clerk at Bitner, and J. J. Moseley will become supply clerk at Leisenring.

F. R. Blair, formerly secretary-treasurer and sales manager of the S. K. F. Ball Bearing Co. has resigned to become president of F. R. Blair & Co., Inc., with offices at 50 Church St., New York City. It is understood that Mr. Blair is engaged in developing motor-efficiency devices.

D. A. Casey, for the past six years machinery salesman for the Westinghouse Electric and Manufacturing Co. throughout the Pittsburgh territory, has resigned and organized the Service Supply and Equipment Co. with offices in the Fulton Building, Pittsburgh, Penn. He will act as sales agent for machinery and supplies in the Pittsburgh district.

OBITUARY

John L. Dickerson, a prominent coal operator of Central Illinois, died recently at his home in Springfield, aged 60 years. Fourteen years ago he sank the mine of the Jones & Adams Coal Co. north of Springfield. He was superintendent of the mine until 6 years ago, when he organized the Dickerson Coal Co., of which he was made president. The company also leased a mine of the Illinois Collieries Co. The mine was operated four years and then the company entered the retail business. Mr. Dickerson had been ill for a year.

INDUSTRIAL NEWS

Hazleton, Penn.—The Lehigh Coal and Navigation Co. has formulated a new agreement with the rockmen employed whereby the men secure an 8-hr. day and a 5% increase in wages.

Philadelphia, Penn.—The coal barge "Exeter," of the Philadelphia & Reading Coal and Iron Co., loaded with coal for Bangor, Me., broke away from the tug "Swatara" in a storm recently and ran ashore at West Chop, Mass.

Connellsville, Penn.—A complete reorganization of the Connellsville Machine and Car Co. was recently announced, the new management comprising the Hon. W. E. Crow, as president, E. R. Floto, vice-president and treasurer, and W. J. Doorley as general manager.

Portland, Me.—The Pocahontas Fuel Co. suffered a damage estimated at $150,000 when one of the big hoisting towers on Long wharf fell from its supporting trestle on June 9 after a cave-in had occurred beneath the foundation of the wharf. This plant was only recently completed.

Philadelphia, Penn.—As illustrating the heavy increase in ocean freights on coal it is reported here that charters are being made in Great Britain for carrying fuel from the River Tyne to Genoa, Italy, usually a trip of 14 days, for $25 a ton as compared with $1.25 before the war.

New York, N. Y.—The Central Foundry Co., of New York, has decided to establish a Western branch office in Chicago. C. C. Todd, who has represented the company for many years in the West, and who about a year ago was elected vice-president of the company, will open this office in Chicago on or about July 1, 1916.

Philadelphia, Penn.—During the month of April the Philadelphia & Reading Ry. carried 1,560,833 tons of bituminous coal, as compared with 1,298,169 tons last April, being an increase of 262,664 tons, but this was a decrease of 157,437 tons compared with March, 1916, with a total of 1,718,270 tons for that month.

St. Louis, Mo.—The West Virginia Coal Co. has taken over the output of the Kerns-Donnewald mine at Worden, Ill., on the Wabash. It has also leased the facilities of the Illinois Traction Co. at the foot of the McKinley bridge which will be occupied by the Laclede Coal Co. a subsidiary company of the West Virginia Coal Co.

Seattle, Wash.—The Jeffrey Mfg. Co., of Columbus, Ohio, recently reopened its Northwestern branch at Seattle. Percy E. Wright, consulting mechanical engineer, is district manager for Oregon, Washington, Alaska, British Columbia, and Alberta. Mr. Wright has had a wide and varied experience throughout the Northwest in handling the Jeffrey line in engineering construction.

Philadelphia, Penn.—Due to the fact that the mines worked only a short time during May on account of the negotiations with the miners not being concluded until late in the month, shipments of anthracite fell off 407,050 tons as compared with the same month last year. However, for the five months of the present year there is an increase of 915,309 tons with a total of 27,784,690 tons.

Philadelphia, Penn.—The Philadelphia & Reading Ry. has once more yielded its position as premier shipper of anthracite to the Lehigh Valley R.R., which latter road in the month of May had a total tonnage of 1,015,264 as compared with the Reading's 963,385 tons. However, for the year the P. & R. still leads with a total of 5,235,815 as compared to the Lehigh Valley's 4,830,006 tons.

Pittston, Penn.—Thorough tests of the new Edison incandescent mining lamp are being made at the Seneca colliery of the Lehigh Valley Coal Co. About 100 lamps are being subjected to the test. The lamp is about the size of the ordinary miner's lamp and is operated by an electric storage battery attached to the miner's belt. The battery contains sufficient current for a day's use.

Uniontown, Penn.—Charles M. Fee, auctioneer, recently sold at trustees' sale, a tract of Sewickley coal in Georges Township. The highest bid, the one at which the property was stricken off, was $1. For crying this sale Mr. Fee received a check of $10. This was the Isaac Good tract of 5-ft. coal owned by the Sunshine Coal and Coke Co., and sold under a court order. The purchaser was A. P. Austin.

Columbus, Ohio—Ohio coal men, especially the operators are taking considerable interest in the meeting in Pittsburgh June 16 under the auspices of the federal trade commission. Invitations to operators were extended by Edward N. Hurley of the commission and it is planned to have a thorough discussion of the bituminous coal situation. Operators from the bituminous district of Pennsylvania and Ohio have been invited.

Boston, Mass.—The Darrow-Mann Coal Co. has just completed negotiations with the Providence city council, whereby it acquires a 20-year lease on about one-fourth of the city's sea wall at Field's Point. The rental price is $15 per front foot, with the privilege of a ten-year renewal. The Darrow-Mann company intends to expend about $300,000 in improvement of the premises, which will be of a nature to increase its distributing facilities.

East St. Louis, Ill.—The operators new association which has been in the process of formation for several weeks was permanently organized recently under the title of the Inner Group Coal Trade News and Efficiency Bureau. The object is to study mining costs and improvements. Another feature is the reporting bureau which has become quite popular and beneficial. The association has already helped conditions which is astonishing from such an infant.

DuBois, Penn.—The Vulcan Soot Cleaner Co., through its New York representative, recently received, what is claimed to be, the largest order on record for the type of apparatus manufactured by that concern. Fifty boilers of the B. & W. type, totalling 35,000 rated horsepower at the Marion plant of the Public Service Electric Co., of New Jersey, are to be equipped with Vulcan cleaners. These boilers are all set singly, which is a favorable condition to hand cleaning.

Philadelphia, Penn.—The Mason-Scholes Coal Co., a retail concern, it is learned has returned to its customers in the way of a refund a pro rata share of $2,000 the amount of "state tax" recently returned to the company. So far as could be determined on June 10, this is the only retailer in the city which has attempted to divide among its customers the money which was returned by the operators as a result of the Supreme Court decision handed down recently declaring the tax law unconstitutional.

Pittsburgh, Penn—The U. S. Steel Corporation is now installing 1,400 byproduct coke ovens of the Kopper type. These will each have a capacity of 5,000 tons annually. It is estimated that the production of 7,000,000 tons of coke by these ovens will meet the yearly requirements of the company and will require 9,500,000 tons of coal. Of this 70 per cent. will come from the company's own mines and 30 per cent. will be purchased. The new ovens will be located near the various points of use in order to obtain most economical results.

Cincinnati, Ohio—The petition of the Continental Coal Corporation and others for review of the decision of the United States District Court for eastern Kentucky refusing to stay involuntary bankruptcy proceedings instituted by Roszelle Bros. and others against the company mentioned has been filed in the United States Circuit Court of Appeals. The Continental Coal Co. filed voluntary proceedings in bankruptcy in the United States District Court for the eastern district of Tennessee, and desired these proceedings given precedence.

Toronto, Canada—With the object of lessening the cost of coal to the consumers and to the city, the city council recently appointed a special committee of civic officials headed by Mayor Church to consider the coal situation and investigate whether prices were kept up by combinations in restraint of trade. They are also to report as to the establishment of proper coal terminals and municipal coal yards. The Committee went to New York recently to see coal operators and railway officials with the view of negotiating for a large supply for Toronto.

Washington, Penn.—Mrs. Belle Hutchison recently brought suit against the Pittsburgh Coal Co. for the recovery of $10,000 damages for personal injury. It appears that Mrs. Hutchison, while living in a house of the defendant company at Gallatin, was seriously injured when the boards of the porch of her home gave way, allowing her to fall through the opening. It is stated that a short time prior to the accident the defendant company reconstructed the porch but in so doing left it in a dangerous and unsafe condition, she alleging that sufficient joists and sills to support the floor were not used, and that the lumber employed was of poor quality.

Norristown, Penn.—Francis V. Eavenson, a Philadelphia business man, who owns a farm in the upper end of Montgomery County, has entered suit against the Philadelphia & Reading Coal and Iron Co. claiming that much of his farm land has been ruined by clum washed onto it from the mines of the above company brought down the river by freshets. This is the second time a suit has been brought in this instance. It created much interest the first time it was tried on account of its being the first time a claim has been made for damage so far, about 90 mi., from the anthracite region, The previous suit was thrown out on account of a technicality.

Philadelphia, Penn.—The city papers are devoting considerable space to the speculation that there may be a still further increase in the price of anthracite coal made by the mine operators. This is based on the fact that the cost of explosives, particularly dynamite, has increased in some instances as much as 200% and has added about 3c. to the cost of mining coal. Under the new agreement signed by the miners and operators the mining companies are compelled to sell explosives to the men at the prices in effect in 1912 and to continue this arrangement throughout the life of the agreement, or until 1920. So far as can be learned the mining companies have not made any move to increase the price of coal, despite the assertions in the newspapers.

Belleville, Ill.—Operators and representatives of the United Mine Workers met on June 8, at the Commercial Club, in an attempt to solve the growing problem presented by the cooperative mines, which are increasing rapidly in the state. The coöperative mines are operated by companies composed of the miners who work in them. While the books of these companies show the payment of the union wage scale it is alleged that rebates are made, enabling these companies to undersell the operators who pay the union scale. The result is that these operators are unable to work their mines and their union employees are out of employment. An effort is to be made to compel the coöperative mines to pay the union scale of wages. Failing in that it is proposed to expel the coöperative miners from the union and endeavor to close the market against the coöperative mines on the ground that they are "unfair." At the conference a joint committee of six operators and four union officials was appointed, as follows: Thomas Brewster, Mt. Olive and Staunton Coal Co.; Lou Lumaghi, Lumaghi Coal Co.; William Jenkins, St. Louis & O'Fallon Coal Co.; Webster Miller, of St. Louis, George A. Wilson, of Marissa and Fred Knowles, of Freeburg, President Frank Farrington and Vice-President Frank Hefferly, of the Illinois United Mine Workers and Edward Dobbins and Moses Johnson, members of the Miners' Executive Board. The committee will make a report to a later conference of operators and miners.

Market Department

General Review

Restricted output sustains the anthracite market. Pittsburgh labor difficulties continue the outstanding feature in the Eastern market. Both exports and Lake trade on the increase. Middle Western situation firm.

Anthracite—The customary summer dullness in anthracite has so far been avoided by the constantly recurring labor troubles which are restricting the tonnage down to just about the absorptive power of the market. It is requiring some effort to keep the coal moving, and occasional concessions are necessary on the smaller grades to avoid demurrage charges. The higher prices have undoubtedly caused a substantial contraction in the customary storage program of all classes of buyers; as a result of this condition it is expected that the summer business may be rather light, but this will ultimately result in a tremendous buying movement in the late fall and winter. Arrivals at down East points have proved a distinct disappointment; supplies were effectually cleaned up at the close of winter, while complications as to increases in both the price of coal and barge rates delayed buying, and it is now doubtful if a sufficient tonnage can be obtained.

Bituminous—Partial resumptions in the Pittsburgh coal district have not been sufficient to relieve the urgent demand for gas coal in the Seaboard market where further advances have been reported during the past week. The shortage has been further accentuated by the scarcity of labor, and a rather unsatisfactory movement on the railroads. Prices are generally well maintained, but in spite of a relatively light output, surpluses are beginning to appear at some of the distributing centers. At down East points the supply and demand are better equalized and there are even definite prospects that the fall months will find the New England market short of steam coal. There is a generally firmer attitude as concerns prices among operating interests due largely to the increasing mining cost. A break in the ocean freight market with plenty of vessels now available for chartering should prove a tremendous stimulus to the export trade, though at the moment there seem to be very few off shore inquiries at hand.

Lake Trade—Conditions in the Pittsburgh district were still hinging almost entirely on the labor situation. In the meantime plenty of West Virginia coal is available at moderate prices, while there is scarcely any extra buying in the prompt market, most consumers withdrawing from the market pending more definite developments expected this week. The district as a whole was producing about one-third normal tonnage over the first half of the week. The continuation of local strikes in other sections also has a tendency to create occasional shortages, particularly where certain mines have been relied upon to meet obligations on specific contracts, but on the average the market is well supplied and these occasional shutdowns are undoubtedly preventing a heavy over-shipping. The Lake business is steadily increasing though still severely handicapped by the scarcity of vessel tonnage, though there is a possibility of a slowing up in ore shipments which will help the coal movement. There is an exceptionally heavy movement from the upper ports to the interior.

Middle Western—The market is being sustained in an unexpectedly impressive manner, and there is evidence of an unlerlying strength in all directions. There is considerable unbilled coal, particularly of the larger sizes, on track at the mines, but operators are holding this firmly for full schedule prices. Steam coals are leading the advance as a result of the great activity among industrial operations. Contracting is on a broader scale than for some time, with prices on a profitable basis to the operators. The Pittsburgh district strike has affected the Lake movement to such an extent that there is a noticeable increase for Middle Western coals in the Northwest. The demand for threshing coal is beginning to appear in the South and will be a steadily increasing factor in this market from now on.

A Year Ago—Concessions on the anthracite circular are readily obtainable in spite of the heavy curtailment. Bituminous exports taxing the loading facilities at Seaboard. Prices a trifle firmer on spot business. Poor showing in the Lake trade.

Business Opinions

Boston News Bureau—There are a few disappointing features in the situation. There never will be a situation where there is not. We are on a high basis of activity and on a high level of prices. Consequently sentiment is more or less sensitive. But on the whole, conditions are most excellent, much better than we had reason to expect a year ago. It is well to remember that this is Presidential year and that means considerable political uncertainty. The loan of $50,000,000 to Russia to be spent in this country is a strong factor. Matters in Mexico indicate larger expenditures by this country for war munitions. Gold continues to flow this way from Ottawa, the influx on present movement now totalling $51,425,000 and still sterling exchange barely holds steady.

American Wool and Cotton Reporter—Boston has had the biggest volume of sales of wool since February. With the embargo still on it is predicted that wool at $1 per lb. will become a common occurrence. There is a large over-production of noils because the worsted mills are so busy. Noils were formerly used in considerable amount for making kerseys, but these fabrics are not made much now, if any. The wool market is very strong. The woolen-goods market is fast changing from the state of inactivity noted for some weeks and a large number of contracts for light-weight fabrics has recently been placed.

Iron Age—Foreign buying is much encouraged by the sharp reductions in ocean freight rates, of 20, 30 and even over 50 per cent. from recent tariffs, and it is of great variety and from all quarters of the globe. Russia looms important in foreign demand. Already the indications are that the Steel Corporation is to supply 150,000 to 200,000 tons of a total of 350,000 tons of 67½-lb. rails; within two or three weeks upward of 10,000 cars will probably be bought here, arrangements for a Russian loan having been perfected, and before the end of the month it is expected that a large tonnage of barb wire will be placed, though hardly the amount commonly spoken of, which is only slightly below the country's annual barb-wire-making capacity. It is doubtful if deliveries on the rails can begin before March.

Dun—Leading industries still surpass in actual output the work of any previous year and in most cases capacity operations are assured for months to come, labor conditions permitting. On strictly domestic business, however, the rush to buy has clearly abated, and there are more definite and convincing signs of a turn in the price situation. Commercial failures this week in the United States are 287 against 292 last week, 314 the preceding week and 426 the corresponding week last year.

Bradstreet—Recessions from past feverish activity confirm the belief that the wire edge is off demand for the time being at least. Consequently trade, partly because of midseason conditions, is quieter, new business received by manufacturers is lighter, distribution by retail dealers has been clogged by cool, rainy weather over a wide area, cereal crop news is disappointing, there is more talk about buying having been carried to extremes during the recent impulsive movement and reselling of speculatively held products, combined with the disposition of buyers in general to hold aloof from markets that are deemed entirely too high, causes a quite general shading of prices.

Dry Goods Economist—The usual between-seasons period is now very clearly defined as regards certain classes of merchandise. The underlying conditions throughout the country continue highly favorable, however, and there is no reason to regard the temporary lull as other than normal. Retail stocks in general are believed to be somewhat heavy, but the present upward price tendencies remove any ground for uneasiness on this score.

Marshall Field & Co.—Current wholesale distribution of dry goods is in equal volume to that of the corresponding period of a year ago, notwithstanding the fact that we did not hold our semi-annual, pre-inventory sale, which event occurred during this week a year ago. Road sales for both immediate and future delivery are well ahead of the same week last year. Customers have been in the market in fewer numbers, but the decrease is accounted for by the pre-inventory sale held a year ago.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River prices somewhat stronger f.o.b. due to shortened supply. Georges Creek grades plentiful. Pennsylvanias show better returns for deferred delivery. Anthracite shipments very slow.

Bituminous—With accumulations much less than for several weeks the agencies are asking higher prices for Pocahontas and New River f.o.b. Quotations less than $2.80 are now practically all withdrawn and for awhile at least receipts at Tidewater will conform to the demand. Spot business is still light with no special improvement in sight so long as bottoms are difficult to get. Most of the coal shipped that is not for export is applied to contracts in this territory taken on a delivered basis and on such tonnage the movement is about normal. Coal, however, that was contracted for on a Hampton Roads f.o.b. basis is not being moved with anything like the same regularity. It seems almost certain now that New England will go into the fall months seriously short of steam coal.

Efforts are being made to get consumers inland to accumulate coal at their plants but the dullness of trade seems to indicate that the response is slow and not very general. The railroads at present are handling coal fairly well, particularly from the Tidewater distributing points. In most cases, there is such a discrepancy in price between the Tidewater coals and those all-rail that the latter have the preference as long as deliveries are coming through in reasonably good time.

The quality coals from the Pennsylvania districts are firmer for deliveries that extend into the fall. For summer these and the lower grades are still on the minimum basis, about 15@25c. higher than last year f.o.b. mines. All the favorably known coals are in good request and most of them have all the business in hand they desire for the winter season. Operating expense is heavy and some mine-owners take the position they will not produce coal unless a remunerative price is forthcoming. The result is a noticeable strengthening of prices all along the line, although no pronounced marking-up has yet taken place for spot orders. If the marine transportation situation would clear up only a little there would be a wholesome market in Tidewater New England for all the good Pennsylvania coal that could reach the loading piers.

Anthracite—Shipments so far in June have been a great disappointment. Retail dealers along the coast particularly are very anxious over the slowness with which cargoes are put afloat. At this rate the shortage of barges will reach an acute stage by September. Ordinarily July and August are quiet months but most dealers of any size have not by any means got their usual April quota as yet. A good deal of dissatisfaction is heard but the simple fact is that this territory was bare of coal at the close of winter and that dealers who were timorous about taking on advance supplies at the full winter circular in April will now find it difficult to make up the tonnage they normally get during April and May.

Bituminous at wholesale, f.o.b. loading ports at points designated, is quoted about as follows, per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.25@2.80	$2.60@3.10	.....	$1.05@1.55
Cambrias and Somersets	2.55@3.00	2.85@3.25	.....	1.30@1.75
Georges Creek (contract)	3.07@3.17	3.37@3.47	$3.00@3.10	$2.00@2.10

Pocahontas and New River are $2.80@2.85, f.o.b. Norfolk and Newport News, Va., and $4.75@5 on cars at Providence and Boston.

NEW YORK

Anthracite labor disturbances cause uneasiness and greater activity. Some sizes scarce. Deliveries slower to line trade. Bituminous prices stiffen. Market feeling effects of Pittsburgh strike.

Anthracite—The labor distrubances in the anthracite region are causing uneasiness and some increased activity among the buyers. Light production has reduced supplies to a minimum and while there is plenty of coal at Tidewater to satisfy present needs dealers along the railroads are complaining because of slow deliveries.

At Tidewater the call for stove coal is the heaviest and there is a shortage of this size. Egg is easy, while chestnut is long, due, probably, to the difference in price between these two sizes. Concessions around 25c. per ton are noted for immediate shipments of chestnut, with smaller reductions on the other large sizes. The demand for pea coal is not active and some cargoes have been moved at 25c. off company circular.

There remains much confusion regarding steam coals and the public is not taking freely to the new boiler coal.

Current quotations, per gross ton, f.o.b. tidewater, at the lower ports are as follows:

	Circular	Individual		Circular	Individual
Broken	$4.95	.....	Pea	$3.50	$3.25@3.50
Egg	5.15	$5.10@5.15	Buck	2.75	2.45@2.75
Stove	5.40	5.30@5.40	Rice	2.25	2.20@2.25
Nut	5.45	5.20@5.45	Barley	1.75	1.65@1.75
			Boiler	2.20	

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—The strike of the soft-coal miners in the Pittsburgh district has caused a better Tidewater market. Supplies are not so large owing to the diverting of some shipment of Central Pennsylvania coals to the sections supplied by the Western operators. Gas coals have almost entirely disappeared from the New York market and no orders can be placed for early shipments. A similar condition relates to the Fairmont grades and has resulted in much higher prices for these coals. Some shipments of Quemahoning coals have been made to the Lake regions to take the place of Pittsburgh coals.

Many of the mines in Central Pennsylvania are troubled with labor shortage and some of them are not producing more than 50 or 60% of their normal capacity. This has resulted in slow shipments to Tidewater and together with demand from the west and lake regions the Tidewater supplies are not as large as a week or ten days ago. Many individual shippers remain under embargo.

Current quotations, per gross ton, f.o.b., Tidewater for various grades follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.50@3.60	$3.50@3.60	$3.50@3.60	$1.95@2.05
Georges Creek Tyson	3.10@3.25	3.10@3.25	3.10@3.25	1.60@1.80
Clearfield: Medium	2.90@3.00	2.90@3.00	.....	1.40@1.50
South Forks	3.25@3.50	.....	.....	1.70@1.95
Nanty Glo	3.10@3.20	.....	.....	1.55@1.65
Somerset County: Medium	2.90@3.00	2.90@3.00	2.90@3.00	1.40@1.50
Quemahoning	.....	3.00@3.10	3.00@3.10	1.45@1.65
West Virginia Fairmont ¾	.....	3.30@3.40	3.30@3.40	1.50@1.60
Fairmont mine run	.....	3.30@3.40	3.30@3.40	1.50@1.60
Western Maryland	.....	2.80@2.90	2.80	1.25@1.35

PHILADELPHIA

Anthracite quiet. Retail men busy on storage orders. Pea price shaded, but other sizes fairly firm. Contract buckwheat strengthens. Bituminous continues rise in Fairmont coals but other grades unaffected.

Anthracite—No great progress toward increased business is being made at this time. The trade is moving along steadily but quietly. There is no particular shortage of any of the sizes and all demands are being met promptly. The petty strikes throughout the region have restricted tonnage, yet each day's new business is needed to absorb the output. It is requiring much effort on the part of salesmen to move coal and little unsolicited business is coming in. Prices on prepared sizes are rather firm, but there is considerable tonnage of the smaller coals on consignment, on which the price is sacrificed to save demurrage charges. Of the larger sizes chestnut is probably the slowest to move and some little cutting is reported.

The large retail dealers are quite busy and most of them now claim to have sufficient orders ahead to carry them from four to six weeks, though they admit that new business has practically ceased, which would indicate an early and unusual rush of fall business. They still hold firm in the belief that the July and August circulars cannot be maintained by the operators though the latter declare they intend to adhere to their new prices this summer or restrict the tonnage.

Egg and stove are moving fairly well, egg in particular. Several fair sized blocks of pea coal have been sold at $2.25, and other sales in car lots to small dealers were made at $2.30, though this last was coal on demurrage that had to be moved promptly. It is also known that considerable tonnage of this size has been placed at $2.50 for delivery until Sept. 1, which justifies the prediction made here several weeks ago. It is imposible so far to find where any of the big interests have cut the price of this size.

The big companies are meeting with gratifying results in their efforts at closing contracts for No. 1 buckwheat at $1.50. One of the largest individual shippers, if not the very largest, has closed for its entire production of the steam coals while one of the large companies who found this business a little difficult at first, now reports itself as being entirely satisfied; another who became uneasy while the business dragged following the announcement of the new rate, closed quite a little business at 5c. and 10c. off the contract figure of $1.50. A large tonnage is known to have been closed by the individuals at $1.30 on which a higher rate might have been obtained had the shippers not weakened

The June prices per gross ton f.o.b. cars mines for line shipment and f.o.b. tide for Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.75	Buckwheat	$1.65	$2.55
Egg	3.85	4.95	Rice	1.00	....
Stove	4.10	5.20	Boiler	.90	1.80
Chestnut	4.20	5.25	Barley	.75	....
Pea	2.50	3.40			

Bituminous—The upward price movement in the Fairmont coals continues the feature of the market. Even though some of the miners in the Pittsburgh district have gone back to work pending an adjustment of the dispute over the wage scale, the output has not been such as to affect the strong demand from West Virginia. The biggest increase was on lump, about 15c., while the other sizes advanced from 5c. to 10c. The Fairmont mines continue much hampered by the shortage of labor, while the railroad movement is only fair.

The Central Pennsylvania coals have not been materially affected by the Pittsburgh trouble, for the reason that the Philadelphia market is well supplied with coal and very little of these grades go west. There is very little new business stirring here; salesmen find it difficult to get new orders and are concentrating most of their efforts on closing contracts, quite a large number of which are still outstanding.

Prices per gross ton at mines are about as follows:

Georges Creek Big Vein	$1.90@2.00	Fairmont gas, ¾	$1.65@1.75
South Fork Miller Vein	1.70@1.80	Fairmont gas, mine-run	1.45@1.55
Clearfield (ordinary)	1.35@1.45	Fairmont gas, slack	1.30@1.40
Somerset (ordinary)	1.30@1.40	Fairmont lump, ordinary	1.50@1.60
West Va. Freeport	1.15@1.25	Fairmont mine-run	1.35@1.45
		Fairmont slack	1.30@1.40

BALTIMORE

Gas coal situation grows tighter. Steam fuels soft and dull. Export movement improves. Anthracite business normal.

Bituminous—The market for steam coals is dull. Despite the light production incident to the labor shortage the demand has not in all cases covered the output and some surplus coal has appeared. Prices hold fairly well except on lower grade steam coals, which in some cases are being sacrificed to avoid demurrage charges. The gas coal market is exceptionally strong. Continued labor disputes in the Pittsburgh district have increased the urgent demand from that section for West Virginia coals, which have again moved upward in price. The sales are mainly mine-run. Prices to the trade in gross tons are about as follows at the mines: Georges Creek Tyson, $1.75; Miller vein, $1.55; Quemahoning, $1.60; Somerset, $1.45; Freeport, $1.05@1.10; Fairmont gas, three-quarter, $1.30@1.35; same, mine-run, $1.30; slack, $1.30.

The export situation is better. During the past week a total of 21,426 tons was loaded here for foreign ports, the best movement for several weeks.

HAMPTON ROADS

Provided the unsettled labor conditions in the Pocahontas field do not curtail the output, Hampton Roads' dumpings for this month will exceed May. The Norfolk & Western alone report some 200,000 tons dumped over their Lamberts Point piers the first week in June. Coastwise tonnage is moving satisfactorily in fair volume, principally on contract business.

Exports continue exceptionally heavy, with a continuous stream of steamers arriving and sailing. This export tonnage is moving almost exclusively by steamers, the bunker requirements of which increase this class of business materially. Some export business is being done in coke in small lots. The reopening of the Panama Canal has caused shipments to the West Coast of South America to pick up. The bunker business is also helped by steamers loading on the Pacific Coast for Europe proceeding through the Canal and calling here for their requirements for the voyage across.

Stocks are light, some shippers being temporarily short. Prices are $2.85@3 for cargo and $3.30 plus trimming for bunkers, both per gross ton.

Bids for 3,000 net tons of coal, for use by the U. S. Army Engineers in the construction of the Norfolk-Beaufort link of the Inland Waterways, were opened on June 12, as follows: W. C. Atwater & Co., Inc., $2.53; Crozer-Pocahontas Co., $2.53; Castner, Curran & Bullitt, Inc., $2.53; Nottingham & Wrenn Co., $2.53; C. G. Blake Co., $2.53.

The "Arna" sailed on June 7 for San Diego, Calif., with a cargo of 8,384 tons for the Navy Department. This cargo was carried in competition with the railroads. The steamer received $8.50 per ton, while the rail rate was $8.711.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

Railroad	Week Ending May 13	May 20	May 27	June 3	June 10
Norfolk & Western	110,696	181,338	160,173	190,408	186,272
Chesapeake & Ohio	95,974	104,703	93,804	100,140	118,809
Virginian	95,198	95,799	79,268	67,196	81,917
Totals	301,868	381,840	323,245	357,744	386,998

Ocean Charters and Freights

OCEAN CHARTERS

Coal freight charters have been reported as follows during the past week:

VIRGINIA

Vessel	Destination	Tons	Rate
Tokio M.	R. Janeiro	2,294	$18.75
Marionga G.	R. Janeiro	2,025	21.60
D. Palmer	R. Janeiro	2,315	18.00
Tiberia[2]	So. Amer.[1]	3,141	15.60[3]
Chiswick	Havana	2,072	
Josephine	Lisbon	1,100	18.00
Sherman	St. Michaels	510	14.00
Rocio	R. Plate	2,321	19.20
E. B. Wiley	Santos	611	18.00
E. Little	Azores	807	14.00
Maine	Ponce	181	

NEW YORK

Vessel	Destination	Tons	Rate
S. S. Thorp	Halifax	434	2.90

BALTIMORE

Vessel	Destination	Tons	Rate
Honduras	Havana	1,461	
Graafaxe	B. del Toro	976	
A. Costa	W. C. Italy	2,418	
Rhine	River Plata	1,536	
Pendleton	Venezuela	456	

PHILADELPHIA

Vessel	Destination	Tons	Rate
Geo. H. Ames	Bermuda	378	
Theoline	Martinique	850	
Maxwell	St. John	260	

[1] West Coast. [2] To one or two ports; if to two ports, $16.20. [3] Sublet.

OCEAN FREIGHTS

The freight market is decidedly easier than a week ago and steamers are offered for all destinations at rates considerably under recent quotations. Unfortunately, there are very few export coal orders, and consequently, not many charterers are in position to take advantage of the reduced freight rates.

To	Rate	To	Rate
Havana	$4.25	Bermuda	$4.50@5.00
Cardenas or Sagua	5.75@6.00	Vera Cruz	6.00@6.50
Cienfuegos	5 50@5.75	Tampico	6.00@6.50
Port au Spain, Trinidad	6.75 about	Rio Janeiro	[4]18.75 about
St. Lucia	6.75 about	Santos*	[3]19.50 about
St. Thomas	6.25@6.50	Montevideo	19.20 about
Barbados	6.75 about	BuenosAires orLa Plata	19.20 about
Kingston	6.00@6.50	Rosario	20.40 about
Curacao	[3]6.25@6.50	West Coast of Italy	31.20 about
Santiago	5.50@6.00	Barcelona**	[5]27.60 about
Guantanamo	5.50@6.00	Chile (good port)	[4]14.40
Demerara		Marseilles	30.00 about

* Consignees paying dockage dues. ** Spanish dues for account of cargo.

[1] 500 tons discharge. [2] 400 tons discharge. [3] And p.c. [4] Net, 1,000 tons discharge. [5] Or other good Spanish port.

W. W. Battie & Co.'s Coal Trade Freight Report.

VESSEL CLEARANCES

The following steamers have cleared from various ports during the past week:

NORFOLK

Vessel	Destination	Tons
G. G. Deering[13]	Pernambuco	1,876
P. M. Brooks[12]	St. Georges	352
Tifton[13]	Bahia	1,014
Washington[12]	Genoa	6,804
Firfield[12]	Buenos Aires	5,770
Saint Hugo[19]	Montevideo	6,626
L. Plymouth[11]	Spezia	5,257
Absalon[11]	Havana	3,189
Nitsa[12]	Savona	5,183
Tasmania[12]	Savona	4,986
Nordfjeld[12]	Naples	5,218
Caprera[12]	Genoa	5,954
Oceano[12]	Savona	5,418
Tokio Maru[2]	Rio de Janeiro	3,609
Wilhelmina[2]	Rio de Janeiro	2,010
Zone[6]	Campana, A. R.	3,546
Bygland[9]	Kingston	3,493
L. M. Snow[13]	San Domingo City	458
Soerakarta[12]	Batavia, Java	8,005
Sirra[12]	Genoa	3,898
Achilles[1]	Cristobal	12,019
A. Accame[12]	Savona	3,641
Novo[12]	Montevideo	2,179
N. M. Porcella[12]	St. Georges	825
Grove[13]	Kingston	1,524
Val Salice[12]	Savona	3,194

NEWPORT NEWS

Vessel	Destination	Tons
P. H. Crowell[4]	Rio de Janeiro	3,995
Maraval[4]	Trinidad, B.W.I.	273
Maraval[4]	Demerara	1,013
Rosina[4]	Montevideo	3,598
E. J. Lawrence[4]	Rio de Janeiro	4,994
Paris[4]	Guantanamo, Cuba	1,792
Wellington[4]	Dakar, F.W.A.	8,396
Jevington[17]	Frey Bentos, A.R.	3,837
Chiswick[4]	Havana	4,801

BALTIMORE

Vessel	Destination	Tons
S. Guiseppi	Italy	1,706
Bertha	Cuba	2,151
Honduras	Cuba	2,809
Andrea Costa	Italy	5,024
Hogland	Sweden	5,828
Richmond	Nassau	393
Graafaxe	Panama	1,753
Santa	Italy	1,498
L. A. Williams	Nassau	264

PHILADELPHIA

Vessel	Destination	Tons
Torne	Narvik	
H. B. Cousins	St. John	
M. Thomas	F. de France	1,161
Jose	Sana Marta	
Petra	Antilla	
McCullough	Frontera	2,500
Theoline	F. de France	378

[1] Atwater & Co.
[2] Baker Whiteley
[3] Barber & Co.
[4] Berwind-White
[5] C. G. Blake Co.
[6] Castner, Curran & Bullitt
[7] Chesapeake & Ohio C. & C. Co.
[8] Crozer-Pocahontas Co.
[9] Hasler Brothers
[10] Flat Top Fuel Co.
[11] New River Coal Co.
[12] Pocahontas Fuel Co.
[13] Smokeless Fuel Co.
[14] C. H. Sprague & Son
[15] Maryland C. & C. Co.
[16] White Oak Coal Co.
[17] Chesapeake & Ohio Coal Agency Co.
[18] Houston Coal Co.
[19] Dexter & Carpenter.

COASTWISE FREIGHTS

The freighting situation is practically unchanged. Vessel and barge owners are still in position to pick their orders and so far as advised the $2 rate to Boston from Hampton Roads has not been shaded. The moment inquiry is made for points other than Portsmouth and Portland, east of Boston rates jump rapidly. On vessels 800 tons or so as high at $2.75 is being paid for points only a little out of the way. For New York loading to Providence and like ports the range is still 80@90c.

LAKE MARKETS

PITTSBURGH

Results of local conventions of miners being awaited. A few more mines resumed pending settlement. Demand light and prices slightly easier.

The week opened with the prompt coal market decidedly dull, as it was thought far from improbable that the strike would be settled by the conventions of miners to be held at Monongahela City, in the Monongahela valley, on Monday, and at McDonald, in the Pan Handle region, on Tuesday. As yet no definite information is available as to the results of these meetings but the serious effort being made by the national officials of the miners to induce them to work at the terms formulated by the operators may succeed, even though the miners work off their feelings by deposing some of their district officials.

West Virginia coal was easily available at the beginning of the week at $2 delivered Pittsburgh, which would be equivalent to $1.62 f.o.b. Pittsburgh district mine taking the usual freight and that would represent the upper limit of the market. There has been no demand to speak of, however, those who had previously been buying prompt coal finding that their purchases of last week would carry them through this week and concluding it would be better to await the week's developments among the miners before making further commitments.

There has been some additional resumption of mines, pending a settlement, but not much, and the union Pittsburgh district is only producing about one-third its normal tonnage. Practically the whole Monongahela valley is idle, excepting the Pigeon Creek region, while on the other hand the Wabash and West Side Belt mines are working almost full, with a few Pan Handle and Youghiogheny valley mines. The supply of Youghiogheny gas coal is not altogether as scant as a week ago. The circular price remains $1.50. For prompt coal we quote the market almost nominal as follows: Slack, $1.50@1.60; mine-run, $1.60; ¾-in., $1.70; 1¼-in., $1.80, basis f.o.b. mine, Pittsburgh district.

BUFFALO

Market rather quiet and production light. Neither anthracite nor bituminous likely to be normal before fall. Lake shipments light. Miners dissatisfied.

Bituminous—There is still much difficulty in many of the mines. Some of the men refuse to work at all and others are working only part of the time; they do not like the wage scale and are also indifferent on account of the good pay they get. At any rate the production is not missed as with the light demand there would be a break in the market if coal was plentiful. It is not easy to get single orders, yet quite a good many shippers are finding it hard to fill their contracts. Scarcely any coal comes from the Pittsburgh district proper and the No. 8 Ohio mines are getting the benefit. By selling about on the basis of $1.35 for three-quarter, on a $1.25 freight rate, the price here is generally favorable to the consumer.

The following prices are still in force, but are somewhat nominal:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.95	$2.75	$2.80
Three-quarter	2.85	2.60	.....
Mine run	2.75	2.50	2.60
Slack	2.40	2.30	2.60

Prices are per net ton, except east of Rochester and Kingston, Ont., where they are per gross ton.

Anthracite—Only about half the usual spring business has been done and the shippers are far from satisfied. At the same time the miners are dissatisfied with everything and ready to strike at all small grievances. Some operators are of the opinion that there is going to be trouble all summer.

The Lake trade is only fairly active. More coal would be shipped if it were available as there is plenty of room on the upper-lake docks. For the week the Lake shipments have been 62,800 tons, when they normally exceed 100,000 tons regularly at this time of the season. The distribution was 35,500 tons to Duluth and Superior, 10,500 tons to Fort William, 6,800 tons to Chicago, 5,200 tons to Ashland, 2,600 tons to Houghton and 2,200 tons to Racine.

The local trade has not been active. Prices have held fairly well. Following are f.o.b. car prices to dealers:

Grate	$5.85	Chestnut	$6.35
Egg	6.10	Pea	5.00
Stove	6.10	Buckwheat	3.50

For putting on board vessels 25c. gross is added. A reduction of 30c. per ton is allowed for June delivery.

TORONTO

Trade continues quiet. Supplies coming forward steadily. Rise in anthracite prices anticipated.

The market continues generally quiet in all lines with stocks well maintained and consignments coming forward steadily. A rise in the price of anthracite next month is anticipated and some consumers are laying in supplies in advance.

Quotations for best grades per short ton are as follows: Retail anthracite, egg, stove and nut, $8; grate, $7.75; pea, $6.75; bituminous steam, $5.25; screenings, $4.50; domestic lump, $6; cannel, $8. Wholesale f.o.b. cars at destination, bituminous three-quarter lump, $4; screenings, $3.25; Pennsylvania smokeless lump, $4.50; Pocahontas lump, $5.50; slack, $3.75.

COLUMBUS

More strength in the domestic trade. Considerable buying for July delivery. Steam business still good.

The demand for domestic sizes is gradually increasing as the stocking season approaches. Quite a few orders have been booked for delivery during July. These are mostly for Pocahontas and West Virginia splints, but orders for Hocking lump are also coming in well. In fact the domestic trade shows considerable strength and dealers are preparing for a busy stocking season. Retail prices are well maintained.

Lake business is increasing in volume as the season advances. A considerable tonnage is moving from Ohio mines to the Northwest. At first only the larger operators participated in the Lake trade, but now some of the smaller operators are shipping. The docks of the Hocking Valley railroad at Toledo have been quite busy during the past week. Lake prices are strong.

With practically every mining scale in the state being adjusted the output from Ohio mines is gradually increasing. Several strikes are still on but the result is not noticeable in the total production. The car situation is unchanged as there is a considerable shortage in the eastern Ohio district.

CLEVELAND

Mine strikes cause a firm market. Slack sells on same basis as mine-run.

Local market conditions are firm, due to the fact that the entire Pittsburgh and Youghiogheny districts are entering their third week of idleness. The demand for Ohio coals, particularly No. 8 for substitution in the Pittsburgh and Mahoning Valley districts is strong. Slack has experienced the sharpest raise, the price being equal to mine-run. The demand for Lake coal is also excellent and the general opinion is that there will be no decline in prices, with exception of screenings, after the Pittsburgh field resumes work. From present indications it does not look as if all the miners would be back to work before the last of month.

The demand for coal for local consumption has not been active and prices here are a shade under those asked for shipment. Should the Pittsburgh field continue on strike much longer the consumers who are not contracted will have to pay more for their coal. Following are the market prices f.o.b.:

Cleveland	¾	Mine-Run	Slack	Lump
No. 8	$2.15	$2.05	$2.05	.....
Cambridge	2.10	2.00	2.05	.....
Middle district	2.10	2.00	2.00	.....
Hocking	....	....	2.00	.....
Youghiogheny	Idle			
Pittsburgh	Idle			
Pocahontas	....	2.70	....	$3.35

CINCINNATI

Improving domestic demand a strong factor in the market. Prices remain firm, with advancing tendencies.

There is a steady improvement in the demand from retailers, who have apparently come to the conclusion that higher, rather than lower prices will prevail later on, and that bargain coal will not be available this summer. Some of the more popular grades have virtually been withdrawn from the market, the producers being loaded up with contracts taking care of their entire production.

With a limited car and labor supply still in evidence, and indications of marked improvement before long in the Lake movement, summer business is expected to be more satisfactory than for several years. The decreasing urgency of the ore movement is expected to facilitate Lake business, by enabling boat owners to give the necessary time to coal shipments, instead of going up the Lakes in ballast, as has been the case frequently of late.

LOUISVILLE

Domestic sizes moving somewhat slower at higher price levels. Pittsburgh field strike improves screenings demand.

With June prices in effect, domestic coals are not selling as readily, although not much complaint is heard. The strike in the Pittsburgh district has improved the demand for Eastern Kentucky screenings. The labor situation in Western

Kentucky seems in a fair way to be settled, although there are some troubles in the eastern field, where two companies have men out and mines idle.

Prices on Eastern Kentucky grades range, f.o.b. mines, long ton basis: Block, $1.35@1.85; egg, $1.15@1.35; steam mine-run, $1@1.10; high-grade nut and slack, 75c.; low grade, 50@55c. No price changes are noted in Western Kentucky.

DETROIT

Interest of steam-coal users centers on nut, pea and slack. Domestic sales of small volume. Lake shippers find boats are scarce.

Bituminous—Users of steam coal are not buying liberally. Orders are lacking in regularity and small in volume. Most of the wholesalers find the situation falling below their expectations. The only varieties that seem to arouse interest are the fine sizes.

No particular improvement has so far developed in the domestic trade. The retail dealers apparently are holding off for something to happen. There is not an excessive amount of coal remaining unsold on railroad tracks due mostly, however, to lessened receipts and not due to active buying.

Lake Trade—Shippers having coal to move over the Lake route, have little success in their attempts to contract for vessel capacity. Carriers of small size are almost unobtainable and there are few of the larger ships available owing to the demands of the iron-ore trade. Unless coal is ready for immediate loading, freighters bound for Lake Superior ports make the up trip without cargo. By far the greater number of boats are operating over that route so shipments to Lake Superior docks have been maintained in large volume. The movement of coal from Duluth and Superior to distributing points in the Northwest has been very active. Shipments from those ports by rail, amounted to 594,580 tons or 16,988 carloads in May, which is an increase of about 50% compared with May last year. For the five months ending May 31, shipments amounted to 4,280,535 tons, which is nearly 900,000 tons more than the record movement for this period made in 1913, following a threatened coal shortage in the Northwest.

COKE

CONNELLSVILLE

Prompt coke market dull. Some contracting for second-half, with $2.75 shaded. Foundry coke dull. Production and shipments slightly decreased.

Prompt furnace coke continued to bring $2.75 throughout last week but this week there is no demand and freer offerings are expected so that the price may not stand. There has been a slight curtailment of output by merchant operators to prevent too much prompt coal pressing on the market and this week opened with a Russian holiday, "Green Tree Day," which may affect production a trifle, The suspensions of shipments on contract that were affecting the market recently are practically all ended.

It is understood that two contracts for second-half furnace coke have been closed, but full details are not available. It appears that the tonnage involved aggregates between 10,000 and 15,000 tons a month and that the present regular asking price of $2.75 was shaded by at least 10c. Some time ago, however, there were sales for second-half at $2.50. There are negotiations now pending on several contracts for second-half, with prospects of closing within a week, and this would leave little uncovered consumption for second-half. Coke producers are much less concerned than formerly over the prospective completion of byproduct ovens, as the work is proceeding slowly and the demand for coal is good.

Foundry coke continues decidedly dull and neglected. While most of the contracts for the period beginning July 1 were closed some time ago there is not much disposition among the remaining consumers to close contracts. Prompt foundry coke is in only fair demand. We quote: Prompt furnace, $2.75; contract, $2.50@2.75; prompt foundry, $3.25@3.50; contract, $3.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended June 8 at 431,872 tons, a decrease of 4,940 tons, and shipments at 431,235 tons, a decrease of 5,756 tons.

Chicago—Retailers still take all the domestic sizes they can obtain. Strengthening tendencies are noted in foundry coke. Prices are approximately on the same basis as last week, being per net ton of f.o.b. cars Chicago as follows: Connellsville, $6@6.25; Wise County, $6@6.25; Byproduct foundry, $6@6.25; byproduct domestic, $4.95@5.20; gas house, $4.50@4.60.

MIDDLE WESTERN

GENERAL REVIEW

Activity restricted. Prices firm at fairly high level. Steam coals very strong. Eastern grades steadier. Anthracite trading moderate.

The demand for bituminous domestic sizes is still on a limited basis. Underlying strength is evident everywhere. Increased prices effective June 1 are generally well observed, with little or no concessions allowed. The coöperative efforts of the Indiana and Illinois operators has effectively eliminated price cutting, and little or no excess stock of the speculative class is reported on track at the large centers. Unbilled coal, consisting mainly of coarse sizes, is now generally held at the mines awaiting disposition at schedule prices.

A larger volume of contracts than usual has been closed recently mostly for steam coals, with prices fixed on a healthy basis. Fine coal prices are firm and generally on a slightly higher level than last week. Western markets are comparatively bare of smokeless and New River consignment shipments. Smokeless operators are either shipping their coal eastward, to the Lakes, or declining to send rail tonnage westward, where the demand is very limited and yards near the over-stocking point at this time. Even contract smokeless shipments have been reduced to the minimum.

Comparatively little coal is reported going into the interior from the docks. Lake tonnage is moderate, and outgoing shipments from the docks to Western points are expected to be light throughout the summer and fall. Quite an increase is noticeable in shipments from southern Illinois mines to the Northwest, indicating a shortage in that territory due to the labor situation in the Pittsburgh field affecting the Lake movement. So far there has been a plentiful supply of labor at Western mines, and operators have been trying to get maximum working time in order to keep their men.

ST. LOUIS

Market quiet but firm. Standard field regaining lost tonnage. Circular prices advanced. Anthracite in fair demand.

The demand is slowly improving and is now about normal for this season of the year. Receipts at East St. Louis are about 30% heavier than last week. Screenings are in stiff demand and are up from 5 to 10c. per ton on the lower grades, while the higher grades remain firm at the same prices. Several railroads have taken some tonnage on contract from the Standard field which formally was taken from other fields and the indications are that this district will regain some of its lost tonnage this year. Thrashing coal is beginning to move in the south.

The Franklin County prices advanced 10c. on the first of the month and while there was a lull in buying for a few days on this account the movement is now as good as could be expected. These mines are running about half time. Lump is dragging and most mines are carrying anywhere from 50 to 200 of no-bill lump cars on track. All other sizes are being absorbed as fast as they are being made at the circular prices. Steam sizes are in strong demand at top prices.

The market is quotable on the following basis per net ton, f.o.b. mines:

	Franklin County	Williamson	Staunton and Montgomery	Intermediate	Standard
6-in. lump	$1.55	$1.45	$1.25	$1.15	$ .95
6x3-in. egg	1.55	1.45	1.25	1.15	.95
3x2-in. nut	1.55	1.45	1.25	1.15	.90
No. 2 nut	1.45	1.20	.....	1.10	.90
No. 3 nut	1.40	1.15	.....	.....	.....
No. 4 nut	1.30	1.00	.....	.....	.....
No. 5 nut	.75	.70	.....	.....	.....
Screenings	1.00	.90	.85	.85	.85
2-in. lump	.....	.....	1.15	1.00	.85
Steam egg	.....	.....	1.15	1.00	.85
Mine-run	1.25	1.10	1.00	1.00	.85
Washed	.....	.....	.....	.....	.....
No. 1 nut	.....	1.55	1.45	1.45	1.35
No. 2 nut	.....	1.40	1.40	1.40	1.25
No. 3 nut	.....	1.30	1.20	1.20	1.10
No. 4 pea	.....	1.20	1.10	1.10	1.10
No. 5 slack	.....	.70	.75	.70	.75

CHICAGO

Conditions show slight improvement. Screenings very strong in the Chicago district. Smokeless situation much improved. Anthracite buying slow.

Very little railroad tonnage is now moving from the Williamson County mines. Their average working time is three days per week, and there is an increasing accumulation of lump and egg, though the finer sizes are readily absorbed. Operators in the Franklin County field are encouraged over the increased orders for domestic sizes. Prices announced on

June 1 are being strictly adhered to, and the operators evince a strong disposition to keep the mines idle rather than to ship at prices below schedule. Screenings are quoted at a minimum of $1, and some sales are being made as high as $1.10. Operations are at about 40% capacity, which is about 10% better than last year at this time.

Some Springfield tonnage is now being sold in St. Louis, but the market for domestic sizes is very quiet. Fine coal from this district is averaging 95c. Railroad shipments are at the minimum quantities covered by contracts.

Steady increase in production of Indiana mines is noticeable, with car shortages appearing here and there on the east and west trunk lines. Steam coal still retains the lead on account of the unusual activity of manufacturing plants. Screenings have advanced about 5c. per ton.

June list prices on Pocahontas and New River are quoted as follows: Lump or egg, $1.90; washed nut, $1.70; straight nut, $1.45; washed pea, $1.35; mine-run, $1.35. On the coarse sizes this circular does not mean much in the Chicago market, since the shippers are obliged to cut these prices to obtain sufficient orders for lump to meet their slack demands. Some off-grade mine-run has sold as low as $1.25, but in most cases $1.35 is the price.

Anthracite buying has not yet attained much magnitude. Most retailers seem to be delaying orders until such time as consumers are more likely to enter the market for the winter's supplies. No unsold coal is accumulating.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars mines:

	Williamson and Franklin Co.	Springfield	Carterville	Clinton	Knox and Greene Cos.
Lump	$1.45@1.55	$1.40@1.50	$1.40@1.60	$1.40@1.50	$1.45@1.60
Steam lump	1.40@1.50	1.25@1.35	....	1.30@1.35	1.30@1.35
2½ and 3-in. lump	....	....	....	....	1.35@1.45
1¼-in. lump	....	....	....	....	1.35@1.40
Egg	1.45@1.55	1.25@1.35	1.35@1.55	1.40@1.50	1.40@1.50
Nut	....	1.25@1.35	....	1.35@1.45	....
No. 1 washed	1.50	....	1.50@1.60	....	....
No. 2 washed	1.35@1.40	....	.95@1.00	....	....
No. 1 nut	1.45	....	1.45	....	....
No. 2 nut	1.35	....	....	....	....
Mine-run	1.25	....	1.25@1.30	1.15@1.30	1.15
Screenings	.95@1.05	.90@ .95	.85@ .95	.95@1.00	1.00@1.05

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.45@1.55	$1.50@1.85	$1.60@1.90	$1.55@1.75	$1.65@1.75
1¼-in. lump	1.35@1.50	....	....	....	1.50
Egg	....	1.35@1.50	1.50@1.90	1.50@1.70	1.60@1.70
Nut	....	1.10@1.30	1.45	1.25@1.45	....
No. 1 nut	1.40@1.45	....	....	....	....
No. 2 nut	1.35	....	....	....	....
Mine-run	1.25	1.15@1.25	1.15@1.25	1.15@1.25	1.25
Screenings	.95@1.05	.95	....	....	....

Kanawha 1¼-in. splint lump $1.40.

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

Shipments of anthracite for May, 1916, as reported to the Anthracite Bureau of Information at Wilkes-Barre, show that the business recovered somewhat from the low point of 4,528,784 long tons in the preceding month of April, but was still 407,050 tons short of the record of May, 1915.

Anthracite shipments for May and the first five months of 1915-16 were as follows:

	May		5 Months	
	1916	1915	1916	1915
Phila. & Reading	963,385	962,986	5,235,815	4,560,860
Lehigh Valley	1,015,264	1,273,106	4,830,006	5,311,595
Cent. R.R. of N. J.	544,899	749,820	2,814,013	3,189,722
Del. Lack. & West.	909,012	851,545	4,233,680	3,680,209
Del. & Hudson	677,405	677,108	2,979,928	3,105,898
Pennsylvania	478,602	508,272	2,587,192	2,523,264
Erie	665,883	610,305	3,347,134	3,053,993
Ont. & Western	161,342	164,819	825,759	853,661
Lehigh & New Eng.	132,107*	156,988	931,163	590,179
	5,547,899	5,954,949	27,784,690	26,869,381

* Exclusive of 21,503 tons delivered to the C. R. R. of N. J. at Hauto.

VIRGINIAN RAILWAY

Shipments of coal over this road for March of the current year amounted to 532,185 tons which compares with 514,547 tons for February and 309,427 tons for March a year ago.

LAKE SHIPMENTS

Shipments of coal through the Sault Ste. Marie Canal for May amounted to 2,326,933 tons of which 2,085,552 tons was bituminous and 251,381 tons anthracite. Tho shipments for April amounted to 606,398 tons of which 100,800 tons were anthracite and 505,598 tons bituminous.

NORFOLK AND WESTERN

Destination of shipments over this road for April and the first four months of last year and this year were as follows, in short tons:

	April		Four Months	
Coal	1915	1916	1915	1916
Tidewater, foreign	365,874	320,680	753,317	993,848
Tidewater, coastwise	216,087	317,655	1,052,009	1,289,151
Domestic	1,618,590	2,244,063	5,807,936	8,636,048
Coke				
Tidewater, foreign	1,122	2,230	2,959	17,456
Domestic	76,450	187,150	284,537	696,079
Total	2,278,123	3,071,778	7,900,758	11,632,582

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts in April and the ten months of the fiscal years 1915 and 1916, in short tons:

	April				Ten Months			
Destination	1916	%	1915	%	1916	%	1915	%
Tidewater	399,727	19	363,167	22	4,297,347	19	3,038,549	18
East	227,082	11	157,710	9	2,321,635	11	2,043,581	12
West	1,342,105	62	1,048,357	63	13,068,719	61	11,159,367	65
Total	1,968,914		1,569,234		19,687,701		16,241,497	
From Connections								
Bituminous	190,070	8	98,394	6	1,881,170	9	931,895	5
Anthra. (local)	82		246		1,527		652	
Anthracite	622		1,205		11,740		11,911	
Total	2,159,688	100	1,669,079	100	21,582,138	100	17,186,142	100
Coke	51,319		21,421		381,310		156,417	

FOREIGN MARKETS

GREAT BRITAIN

May 31—A scheme has now been adopted limiting coal prices for France to $7.20 for large (seconds) and $4.80 for smalls. Colliery owners are firmly adhering to the undermentioned figures for bunker supplies, and for exports to destinations outside the limitation scheme. Supplies of coal are still extremely short and loading turns difficult to arrange before Whitsun. Approximate f.o.b. quotations are:

Best Welsh steam	Nominal	Best Monmouthshires	$13.08@13.20
Best seconds	Nominal	Seconds	12.00@12.60
Seconds	$12.96@13.20	Best Cardiff smalls	7.68@ 7.92
Best dry coals	10.80@12.00	Cargo smalls	6.00@ 6.72

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freight—The market is at present in a very unsettled state, and Mediterranean rates especially show heavy declines. Rates are approximately as follows:

Gibraltar	$12.00	Naples	$16.80	St. Vincent	$12.00
Marseilles	14.84	Alexandria	24.60	River Plate	13.80
Algiers	....	Port Said	24.00		
Genoa	16.80	Las Palmas	11.40		

Exports—British exports for April and the four months of the past three years were as follows:

	April			Four Months		
To	1914	1915	1916	1914	1915	1916
Russia	218,445	5,404	....	771,000	5,404	....
Sweden	281,932	264,286	112,982	1,028,010	1,021,563	485,076
Norway	185,219	228,765	182,186	880,543	921,109	704,630
Denmark	193,853	258,217	203,459	913,622	991,224	805,970
Germany	691,939	....	....	2,566,953	....	....
Netherlands	134,516	102,532	96,025	552,708	540,184	361,860
Belgium	102,393	....	....	594,384	....	....
France	977,847	1,478,279	1,274,256	4,769,297	5,398,042	5,308,702
Portugal[1]	111,833	65,823	71,995	464,695	365,130	341,081
Spain[4]	292,197	167,567	143,834	1,251,119	706,610	705,448
Italy	659,192	462,391	430,590	3,051,507	2,222,413	1,751,554
Aus. Hung.	86,036	....	....	304,226	....	....
Greece	65,684	38,647	24,334	252,713	150,425	63,033
Roumania	29,348	....	....	75,673	....	....
Turkey	45,741	3,073	....	217,375	3,073	....
Algeria	88,068	108,356	69,280	409,922	361,051	293,104
Portuguese[5]	23,682	7,598	10,218	86,658	73,135	86,465
Chile	37,207	9,139	9,858	184,065	21,979	11,576
Brazil	93,327	94,551	21,819	487,546	258,055	121,104
Uruguay	54,148	30,275	35,810	238,260	158,950	123,351
Argentine	312,518	201,020	118,185	1,324,264	738,891	450,264
Channel Is.	9,434	12,454	8,976	50,885	44,749	33,280
Gibraltar	48,132	31,708	57,084	145,445	134,468	180,548
Malta	31,443	13,101	1,194	180,366	41,795	23,641
Egypt[2]	263,695	120,815	50,593	1,146,699	517,512	223,095
Aden[3]	10,761	24,746	572	63,412	46,841	5,908
India	26,659	261	....	66,959	11,171	8,615
Ceylon	36,508	....	....	123,224	17,131	12,856
Miscell'ous.	102,261	40,756	37,480	442,857	238,585	150,397
Coke	67,615	70,523	111,134	369,364	305,697	479,378
Briquettes	164,095	145,559	128,205	666,276	388,907	444,409
Total	5,445,728	3,985,846	3,200,069	23,680,027	15,684,094	13,175,345
Bunker	1,624,282	1,175,764	962,814	6,659,730	5,154,395	4,236,038

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.